

**PHASE 3  
DEVELOPMENT AREA  
SEE SHEET MT1.03**


**PHASE 4  
DEVELOPMENT AREA  
SEE SHEET MT1.04**

**PHASE 5  
DEVELOPMENT AREA  
SEE SHEET MT1.05**

**PHASE 6  
DEVELOPMENT AREA  
SEE SHEET MT1.06**

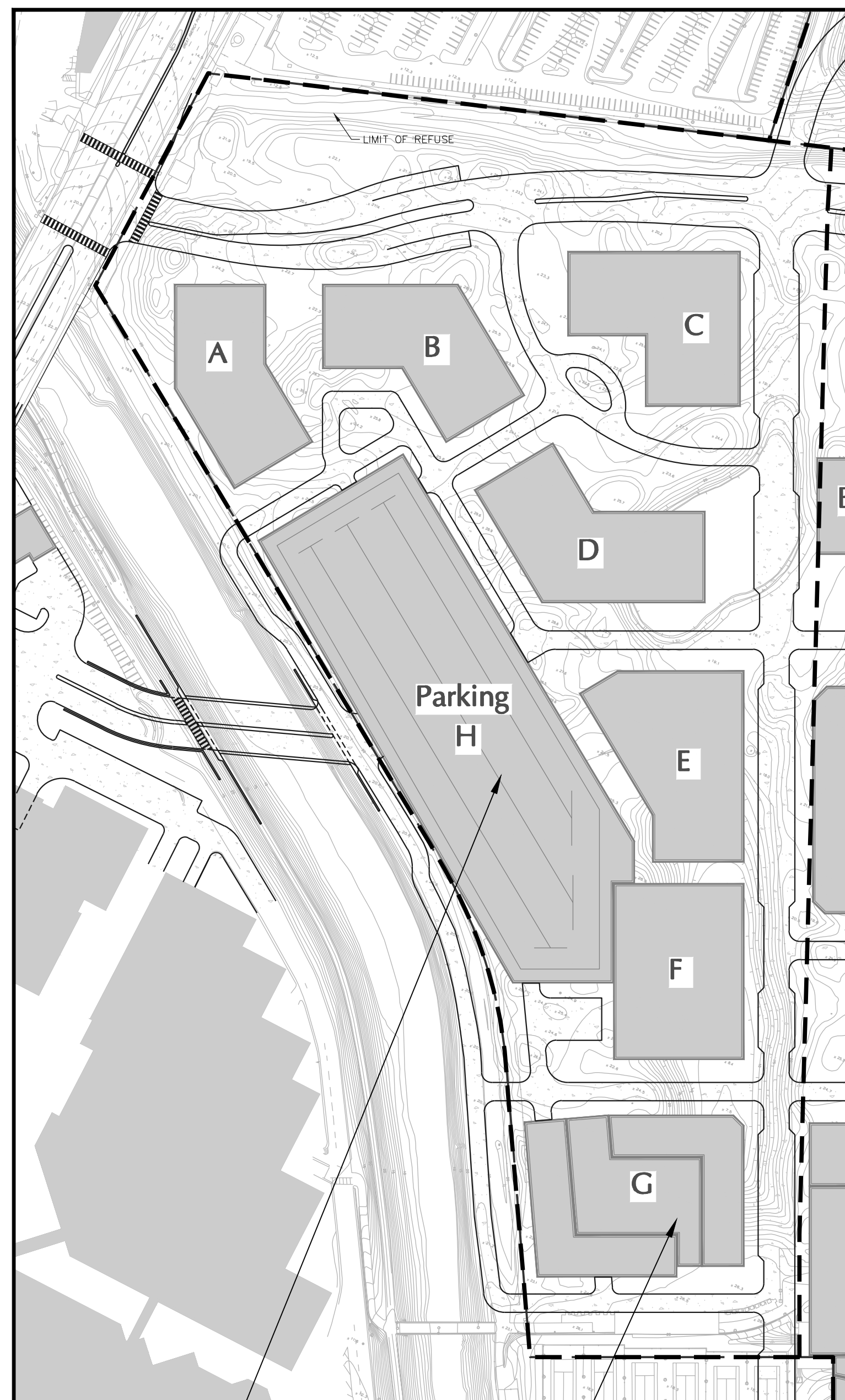
**PHASE 7  
DEVELOPMENT AREA  
SEE SHEET MT1.07**

PRELIMINARY DRAFT,  
NOT FOR  
CONSTRUCTION

Date	Description	No.
REVISIONS		
 <p>4030 Moorpark Avenue, Suite 210, San Jose, CA 95117  T: 408.551.6700 F: 408.551.0344 www.langan.com</p> <p>NEW JERSEY NEW YORK CONNECTICUT PENNSYLVANIA OHIO  VIRGINIA WASHINGTON DC FLORIDA NORTH CAROLINA CALIFORNIA</p> <p>ABU DHABI ATHENS DOHA DUBAI ISTANBUL</p> <p>Longer Engineering, Environmental, Seismic and Landscape Architecture, D.P.C.  Longer Engineering and Environmental Services, Inc.  Longer International LLC  Consulting across the globe</p>		
Project		
<p>CITY PLACE  SANTA CLARA</p>		
SANTA CLARA		CALIFORNIA
Figure Title		
<p>LANDFILL GAS  BUILDING  MITIGATION SYSTEM  PROJECT PLAN</p>		
Project No.		Figure
770511601		MT1.01
Date		
12/23/2014		
Scale		
AS SHOWN		
Drawn By	Checked By	
CY	AP	
Submission Date		
X		Sheet 1 of 10



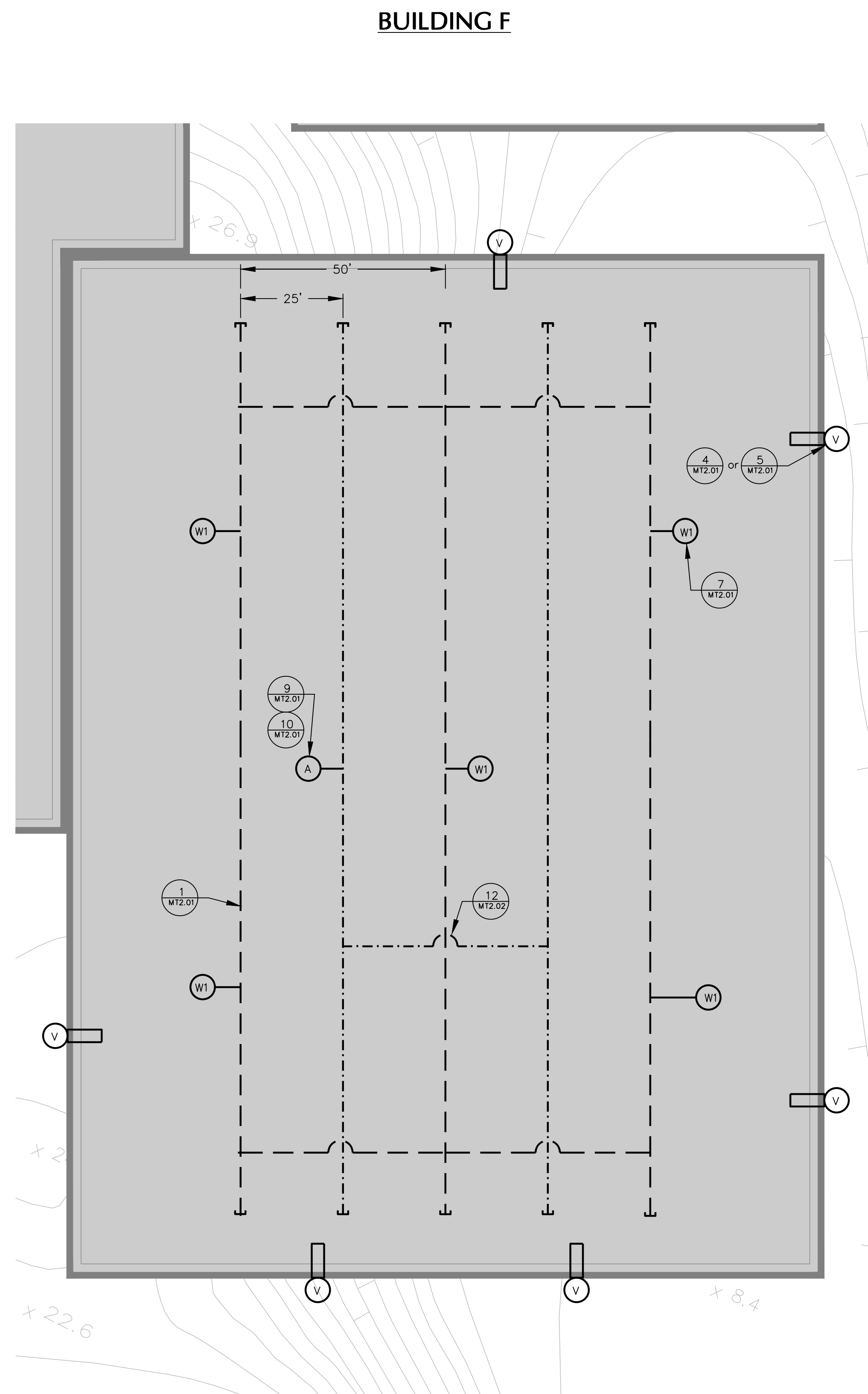




SCALE: 1" = 150'

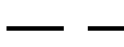
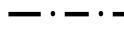




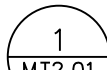
– FOR PARKING STRUCTURES, PLACE VAPOR MEMBRANE AND VENT PIPING ABOVE STRUCTURAL SLAB (SEE DETAIL 2, SHEET MT2.01).

– PLACE VAPOR MEMBRANE AND VENT PIPING WITHIN INTERSTITIAL SPACE ABOVE STRUCTURAL SLAB FOR NON-PARKING STRUCTURES (SEE DETAIL 1, SHEET MT2.01).



CONCEPTUAL LANDFILL GAS BUILDING  
MITIGATION PLAN (TYPICAL FOR ALL  
PHASE 3 BUILDINGS

## LEGEND

- |   |  |
|---|--|
|  | PASSIVE 4" DIAMETER PERFORATED PVC PIPE ABOVE STRUCTURAL PLATFORM<br>(SEE NOTE 5 ON SHEET MT2.02 FOR REQUIRED PERFORATION PATTERN)               |
|  | CONTINGENCY ACTIVE 4" DIAMETER PERFORATED PVC PIPE ABOVE<br>STRUCTURAL PLATFORM<br>(SEE NOTE 5 ON SHEET MT2.02 FOR REQUIRED PERFORATION PATTERN) |
|  | PVC END CAP  |
|  | PASSIVE RISER PIPE TO ROOF<br>(SEE DETAILS ON SHEET MT2.01)  |
|  | RISER PIPE TO CONTINGENCY ACTIVE BLOWER ON ROOF<br>(SEE DETAILS ON SHEET MT2.01)   |
|  | 4" DIAMETER SCHEDULE 80 PVC VENT PIPE<br>(SEE DETAILS ON SHEET MT2.01)   |
|  | SEE DETAIL 1, SHEET MT2.01   |

## NOTES

- 1) VENT PIPES WILL AVOID PILE CAPS AND OTHER FOUNDATION FEATURES, WHERE POSSIBLE, AND ALL AREA OF BUILDING FOOTPRINT WILL BE WITHIN 25 FEET OF VENT PIPE WITH NO OBSTRUCTION TO FLOW (EG, GRADE BEAM IN THE WAY). CONTINGENCY ACTIVE EXTRACTION PIPING PLACED HALFWAY IN BETWEEN RUNS OF VENT PIPING.
- 2) FINAL PIPING LAYOUT WILL BE DESIGNED UPON COMPLETION OF STRUCTURAL DRAWINGS.
- 3) INLET VENTS WILL BE AS EVENLY SPACED AS POSSIBLE AND GREATER THAN 15 FEET FROM DOOR OR WINDOWS.

- 4) RISER AND INLET VENT LOCATIONS WILL BE COORDINATED WITH THE DESIGN TEAM.
- 5) CONTINGENCY (ACTIVE) BLOWER FLOW AND VACUUM REQUIREMENTS SHALL BE REVIEWED FOLLOWING PILOT TESTING OF THE LFG COLLECTION SYSTEM, IF PERFORMED.
- 6) DRAWING SYMBOLS NOT TO SCALE.
- 7) COMPONENTS FOR LANDFILL GAS MITIGATION SYSTEM (LGMS) ARE TYPICAL FOR ALL BUILDINGS.
- 8) BASE DRAWING IS PROVIDED BY LANGAN, 1 NOV 2014.
- 9) FOR DETAIL NOTES, SEE SHEET MT2.02.

Phase 3							
Building Letter	Square Footage (ft <sup>2</sup> )	Perimeter (ft)	Number of Inlet Vents	Number of Risers & Wind Turbines	Blower Flow Rating Required (scfm)	Blower Vacuum Requirement (" H <sub>2</sub> O)	Building Type
A	36126	815	5	4	298	17	Building
B	38165	860	6	4	315	22	Building
C	44000	940	6	4	363	22	Building
D	44785	949	6	4	369	22	Building
E	46753	912	6	5	386	22	Building
F	46218	869	6	5	381	22	Building
G	71310	1081	7	7	588	22	Building
H	180686	1978	13	18	663	22	Parking Garage

## NOTES

- 1) For blower flow ratings greater than 400 scfm, install multiple blowers such that each blower is less than 400 scfm.
- 2) Frequency of inlet vents, riser and wind turbines, and blower requirements based on conceptual calculations. The design engineer shall determine the actual number and frequency of these components at the time of design.

PRELIMINARY DRAFT,  
NOT FOR  
CONSTRUCTION

Date	Description	No.
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## REVISIONS



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ABU DHABI ATHENS DOHA DUBAI ISTANBUL

Langan Engineering, Environmental, Surveying and Landscape Architecture, D  
Langan Engineering and Environmental Services, Inc.  
Langan CT, Inc.  
Langan International LLC  
Collectively known as Langan

Project

CITY PLACE  
SANTA CLARA

**SANTA CLARA**

## CALIFORNIA

Figure Title

Figure Title

**PHASE 3  
DEVELOPMENT AREA  
CONCEPTUAL LANDFILL  
GAS BUILDING  
MITIGATION PLAN**

Project No.

Figure

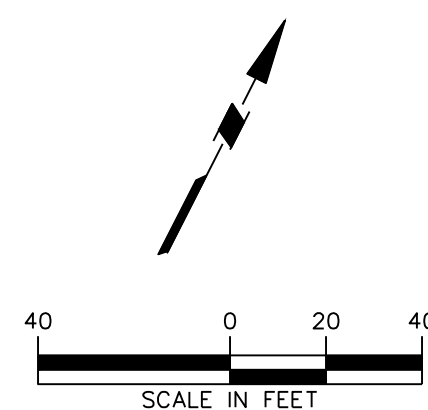
MT1.03

Scale

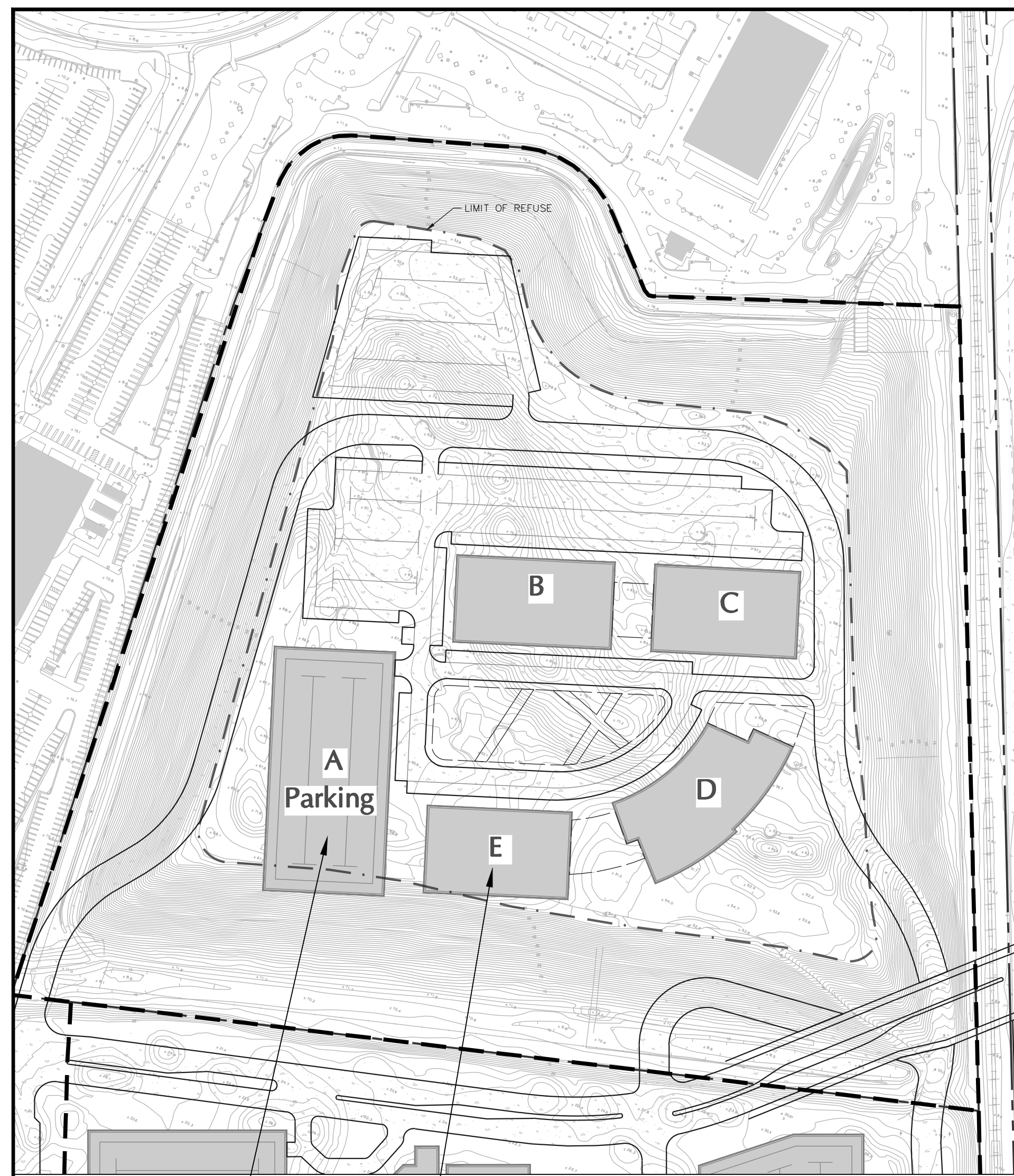
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Sheet 3 of 10







SCALE: 1" = 150'

— PLACE VAPOR MEMBRANE AND VENT PIPING WITHIN INTERSTITIAL SPACE ABOVE STRUCTURAL SLAB FOR NON-PARKING STRUCTURES (SEE DETAIL 1, SHEET MT2.01).

— FOR PARKING STRUCTURES, PLACE VAPOR MEMBRANE AND VENT PIPING ABOVE STRUCTURAL SLAB (SEE DETAIL 2, SHEET MT2.01).

### LEGEND

PASSIVE 4" DIAMETER PERFORATED PVC PIPE ABOVE STRUCTURAL PLATFORM  
(SEE NOTE 5 ON SHEET MT.02 FOR REQUIRED PERFORATION PATTERN)

CONTINGENCY ACTIVE 4" DIAMETER PERFORATED PVC PIPE ABOVE  
STRUCTURAL PLATFORM  
(SEE NOTE 5 ON SHEET MT.02 FOR REQUIRED PERFORATION PATTERN)

PVC END CAP

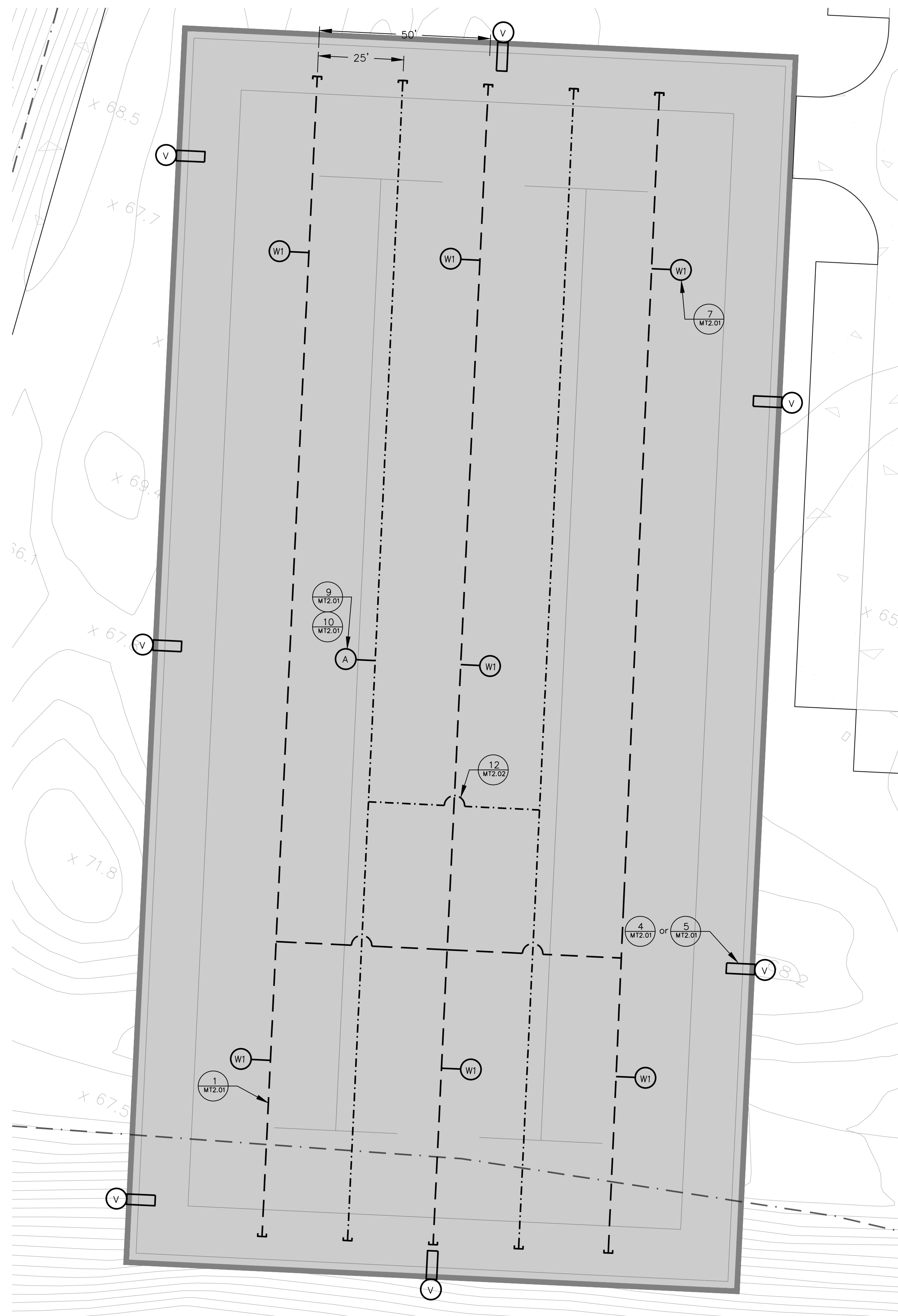
PASSIVE RISER PIPE TO ROOF  
(SEE DETAILS ON SHEET MT2.01)

RISER PIPE TO CONTINGENCY ACTIVE BLOWER ON ROOF  
(SEE DETAILS ON SHEET MT2.01)

4" DIAMETER SCHEDULE 80 PVC VENT PIPE  
(SEE DETAILS ON SHEET MT2.01)

SEE DETAIL 1, SHEET MT2.01

BUILDING A



## CONCEPTUAL LANDFILL GAS BUILDING MITIGATION PLAN (TYPICAL FOR ALL PHASE 4 BUILDINGS)

## NOTES

- 1) VENT PIPES WILL AVOID PILE CAPS AND OTHER FOUNDATION FEATURES, WHERE POSSIBLE, AND ALL AREA OF BUILDING FOOTPRINT WILL BE WITHIN 25 FEET OF VENT PIPE WITH NO OBSTRUCTION TO FLOW (EG, GRADE BEAM IN THE WAY). CONTINGENCY ACTIVE EXTRACTION PIPING PLACED HALFWAY IN BETWEEN RUNS OF VENT PIPING.
- 2) FINAL PIPING LAYOUT WILL BE DESIGNED UPON COMPLETION OF STRUCTURAL DRAWINGS.
- 3) INLET VENTS WILL BE AS EVENLY SPACED AS POSSIBLE AND GREATER THAN 15 FEET FROM DOOR OR WINDOWS.

- 4) RISER AND INLET VENT LOCATIONS WILL BE COORDINATED WITH THE DESIGN TEAM.
- 5) CONTINGENCY (ACTIVE) BLOWER FLOW AND VACUUM REQUIREMENTS SHALL BE REVIEWED FOLLOWING PILOT TESTING OF THE LFG COLLECTION SYSTEM, IF PERFORMED.
- 6) DRAWING SYMBOLS NOT TO SCALE.
- 7) COMPONENTS FOR LANDFILL GAS MITIGATION SYSTEM (LGMS) ARE TYPICAL FOR ALL BUILDINGS.
- 8) BASE DRAWING IS PROVIDED BY LANGAN, 1 NOV 2014.
- 9) FOR DETAIL NOTES, SEE SHEET MT2.02.

Phase 4							
Building Letter	Square Footage (ft <sup>2</sup> )	Perimeter (ft)	Number of Inlet Vents	Number of Risers & Wind Turbines	Blower Flow Rating Required (scfm)	Blower Vacuum Requirement (" H <sub>2</sub> O)	Building Type
A	65160	1084	7	7	239	17	Parking Garage
B	30550	730	5	3	252	17	Building
C	28126	562	4	3	232	17	Building
D	32129	791	5	3	265	17	Building
E	27950	690	5	3	231	17	Building

## NOTES

- 1) For blower flow ratings greater than 400 scfm, install multiple blowers such that each blower is less than 400 scfm.
- 2) Frequency of inlet vents, riser and wind turbines, and blower requirements based on conceptual calculations. The design engineer shall determine the actual number and frequency of these components at the time of design.

PRELIMINARY DRAFT,  
NOT FOR  
CONSTRUCTION

Date	Description	No.
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## REVISIONS



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Langan CT, Inc.  
Langan International LLC  
Collectively known as Langan

Project	
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CITY PLACE  
SANTA CLARA

**SANTA CLARA**

CALIFORNIA

Figure Title

Figure Title

**PHASE 4**

**DEVELOPMENT AREA**

**CONCEPTUAL LANDFILL**

**GAS BUILDING**

**MITIGATION PLAN**

Project No.

Figure

77061160

77061160

Date 12/23/201

12/23/201

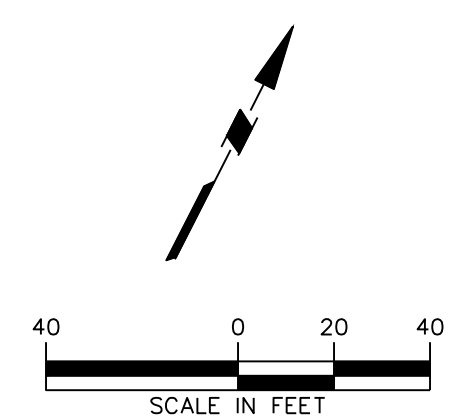
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**AS SHOW**

MT1.04

Sheet 4 of 10





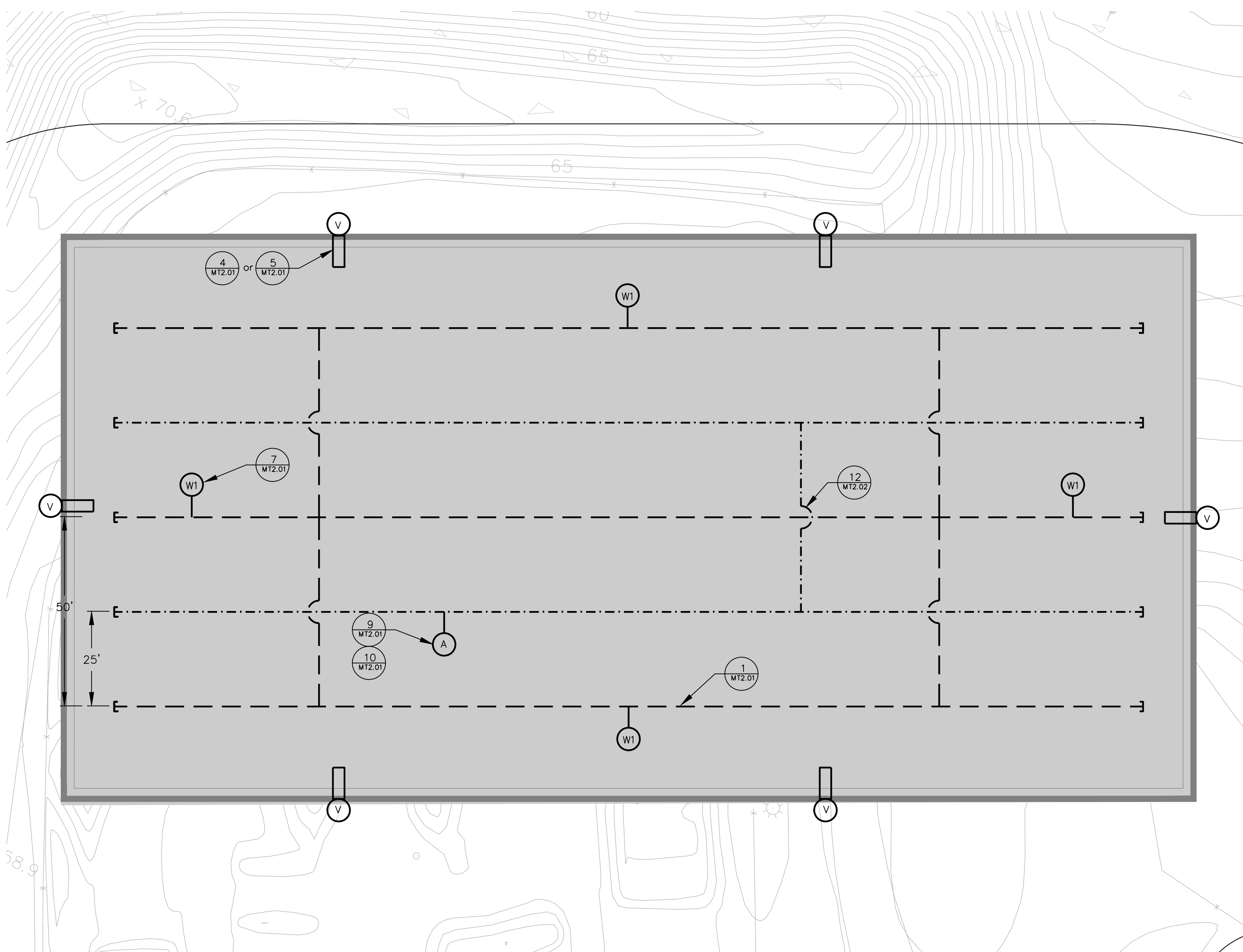


SCALE: 1" = 150'

– PLACE VAPOR MEMBRANE AND VENT PIPING WITHIN INTERSTITIAL SPACE ABOVE STRUCTURAL SLAB FOR NON-PARKING STRUCTURES (SEE DETAIL 1, SHEET MT2.01).


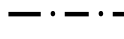





FOR PARKING STRUCTURES, PLACE VAPOR MEMBRANE AND VENT PIPING ABOVE STRUCTURAL SLAB (SEE DETAIL 2, SHEET MT2.01).

## BUILDING A



## CONCEPTUAL LANDFILL GAS BUILDING MITIGATION PLAN (TYPICAL FOR ALL PHASE 5 BUILDINGS)

## LEGEND

- |   |  |
|---|--|
|  | PASSIVE 4" DIAMETER PERFORATED PVC PIPE ABOVE STRUCTURAL PLATFORM<br>(SEE NOTE 5 ON SHEET MT2.02 FOR REQUIRED PERFORATION PATTERN)               |
|  | CONTINGENCY ACTIVE 4" DIAMETER PERFORATED PVC PIPE ABOVE<br>STRUCTURAL PLATFORM<br>(SEE NOTE 5 ON SHEET MT2.02 FOR REQUIRED PERFORATION PATTERN) |
|  | PVC END CAP  |
|  | PASSIVE RISER PIPE TO ROOF<br>(SEE DETAILS ON SHEET MT2.01)  |
|  | RISER PIPE TO CONTINGENCY ACTIVE BLOWER ON ROOF<br>(SEE DETAILS ON SHEET MT2.01)   |
|  | 4" DIAMETER SCHEDULE 80 PVC VENT PIPE<br>(SEE DETAILS ON SHEET MT2.01)   |
|  | SEE DETAIL 1, SHEET MT2.01   |

## NOTES

- 1) VENT PIPES WILL AVOID PILE CAPS AND OTHER FOUNDATION FEATURES, WHERE POSSIBLE, AND ALL AREA OF BUILDING FOOTPRINT WILL BE WITHIN 25 FEET OF VENT PIPE WITH NO OBSTRUCTION TO FLOW (EG, GRADE BEAM IN THE WAY). CONTINGENCY ACTIVE EXTRACTION PIPING PLACED HALFWAY IN BETWEEN RUNS OF VENT PIPING.
- 2) FINAL PIPING LAYOUT WILL BE DESIGNED UPON COMPLETION OF STRUCTURAL DRAWINGS.
- 3) INLET VENTS WILL BE AS EVENLY SPACED AS POSSIBLE AND GREATER THAN 15 FEET FROM DOOR OR WINDOWS.

- 4) RISER AND INLET VENT LOCATIONS WILL BE COORDINATED WITH THE DESIGN TEAM.
- 5) CONTINGENCY (ACTIVE) BLOWER FLOW AND VACUUM REQUIREMENTS SHALL BE REVIEWED FOLLOWING PILOT TESTING OF THE LFG COLLECTION SYSTEM, IF PERFORMED.
- 6) DRAWING SYMBOLS NOT TO SCALE.
- 7) COMPONENTS FOR LANDFILL GAS MITIGATION SYSTEM (LGMS) ARE TYPICAL FOR ALL BUILDINGS.
- 8) BASE DRAWING IS PROVIDED BY LANGAN, 1 NOV 2014.
- 9) FOR DETAIL NOTES, SEE SHEET MT2.02.

Phase 5							
Building Letter	Square Footage (ft <sup>2</sup> )	Perimeter (ft)	Number of Inlet Vents	Number of Risers & Wind Turbines	Blower Flow Rating Required (scfm)	Blower Vacuum Requirement (" H <sub>2</sub> O)	Building Type
A	39750	830	6	4	328	22	Building
B	45000	900	6	5	371	22	Building
C	41047	850	6	4	339	22	Building
D	108546	1249	8	11	398	22	Parking Garage
E	45000	900	6	5	371	22	Building
F	59067	1020	7	6	217	17	Parking Garage
G	30550	730	5	3	252	17	Building
H	100638	1270	8	10	369	22	Parking Garage
I	1934	176	1	0	16	12	Building
J	3876	257	2	0	32	12	Building

## NOTES

- 1) For blower flow ratings greater than 400 scfm, install multiple blowers such that each blower is less than 400 scfm.
- 2) Frequency of inlet vents, riser and wind turbines, and blower requirements based on conceptual calculations. The design engineer shall determine the actual number and frequency of these components at the time of design.

PRELIMINARY DRAFT,  
NOT FOR  
CONSTRUCTION

Date	Description	No.
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## REVISIONS



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Langan CT, Inc.  
Langan International LLC  
Collectively known as Langan

Project

CITY PLACE  
SANTA CLARA

**SANTA CLARA**

## CALIFORNIA

Figure Title

Figure Title

**PHASE 5  
DEVELOPMENT AREA  
CONCEPTUAL LANDFILL  
GAS BUILDING  
MITIGATION PLAN**

Project No.

Figure

770611601

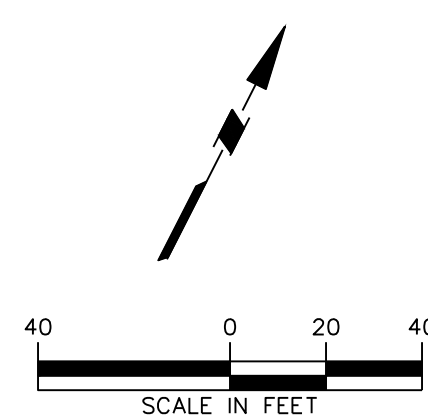
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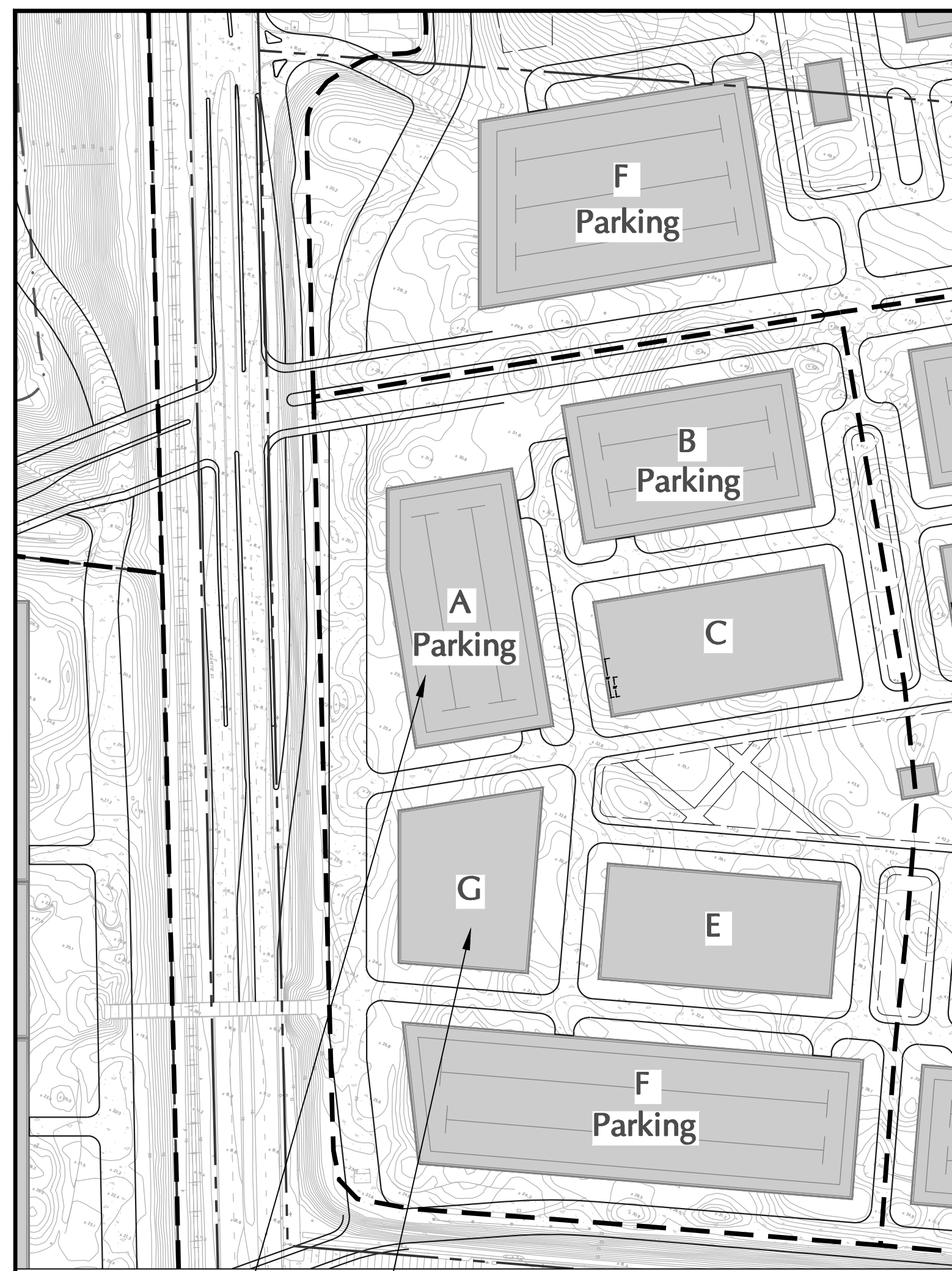
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MT1.05

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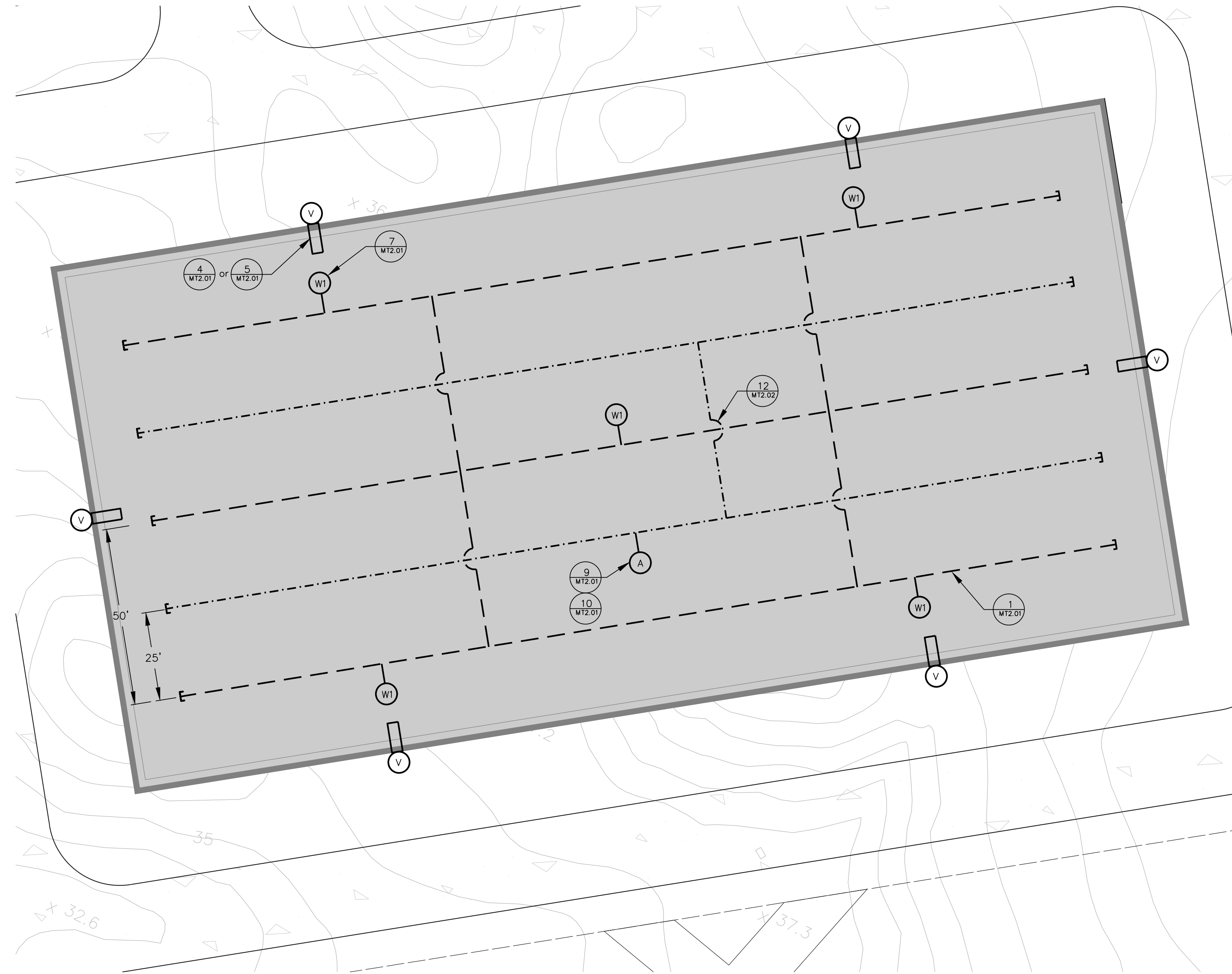




SCALE: 1" = 150'

– PLACE VAPOR MEMBRANE AND VENT PIPING WITHIN INTERSTITIAL SPACE ABOVE STRUCTURAL SLAB FOR NON-PARKING STRUCTURES (SEE DETAIL 1, SHEET MT2.01).

– FOR PARKING STRUCTURES, PLACE VAPOR MEMBRANE AND VENT PIPING ABOVE STRUCTURAL SLAB (SEE DETAIL 2, SHEET MT2.01).

BUILDING C

### LEGEND

PASSIVE 4" DIAMETER PERFORATED PVC PIPE ABOVE STRUCTURAL PLATFORM  
(SEE NOTE 5 ON SHEET MT2.02 FOR REQUIRED PERFORATION PATTERN)

CONTINGENCY ACTIVE 4" DIAMETER PERFORATED PVC PIPE ABOVE  
STRUCTURAL PLATFORM  
(SEE NOTE 5 ON SHEET MT.02 FOR REQUIRED PERFORATION PATTERN)

PVC END CAP

PASSIVE RISER PIPE TO ROOF  
(SEE DETAILS ON SHEET MT2.01)

RISER PIPE TO CONTINGENCY ACTIVE BLOWER ON ROOF  
(SEE DETAILS ON SHEET MT2.01)

4" DIAMETER SCHEDULE 80 PVC VENT PIPE  
(SEE DETAILS ON SHEET MT2.01)

SEE DETAIL 1, SHEET MT2.01

## NOTES

- 1) VENT PIPES WILL AVOID PILE CAPS AND OTHER FOUNDATION FEATURES, WHERE POSSIBLE, AND ALL AREA OF BUILDING FOOTPRINT WILL BE WITHIN 25 FEET OF VENT PIPE WITH NO OBSTRUCTION TO FLOW (EG, GRADE BEAM IN THE WAY). CONTINGENCY ACTIVE EXTRACTION PIPING PLACED HALFWAY IN BETWEEN RUNS OF VENT PIPING.
- 2) FINAL PIPING LAYOUT WILL BE DESIGNED UPON COMPLETION OF STRUCTURAL DRAWINGS.
- 3) INLET VENTS WILL BE AS EVENLY SPACED AS POSSIBLE AND GREATER THAN 15 FEET FROM DOOR OR WINDOWS.

- 4) RISER AND INLET VENT LOCATIONS WILL BE COORDINATED WITH THE DESIGN TEAM.
- 5) CONTINGENCY (ACTIVE) BLOWER FLOW AND VACUUM REQUIREMENTS SHALL BE REVIEWED FOLLOWING PILOT TESTING OF THE LFG COLLECTION SYSTEM, IF PERFORMED.
- 6) DRAWING SYMBOLS NOT TO SCALE.
- 7) COMPONENTS FOR LANDFILL GAS MITIGATION SYSTEM (LGMS) ARE TYPICAL FOR ALL BUILDINGS.
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- 9) FOR DETAIL NOTES, SEE SHEET MT2.02.

Phase 6							
Building Letter	Square Footage (ft <sup>2</sup> )	Perimeter (ft)	Number of Inlet Vents	Number of Risers & Wind Turbines	Blower Flow Rating Required (scfm)	Blower Vacuum Requirement (" H <sub>2</sub> O)	Building Type
A	59454	910	6	6	218	17	Parking Garage
B	54000	960	6	5	198	14	Parking Garage
C	45000	900	6	5	371	22	Building
D	1936	176	1	0	16	12	Building
E	45000	900	6	5	371	22	Building
F	103487	1513	10	10	379	22	Parking Garage
G	33269	741	5	3	274	17	Building

## NOTES

- 1) For blower flow ratings greater than 400 scfm, install multiple blowers such that each blower is less than 400 scfm.
- 2) Frequency of inlet vents, riser and wind turbines, and blower requirements based on conceptual calculations. The design engineer shall determine the actual number and frequency of these components at the time of design.

PRELIMINARY DRAFT,  
NOT FOR  
CONSTRUCTION

Date	Description	No.
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Collectively known as Langan

Project

CITY PLACE  
SANTA CLARA

**SANTA CLARA**

Figure Title

**PHASE 6  
DEVELOPMENT AREA  
CONCEPTUAL LANDFILL  
GAS BUILDING  
MITIGATION PLAN**

Project No.  
770611601

Date \_\_\_\_\_

12/23/2014
Scale

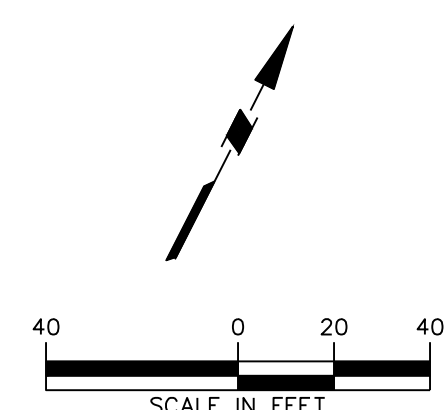
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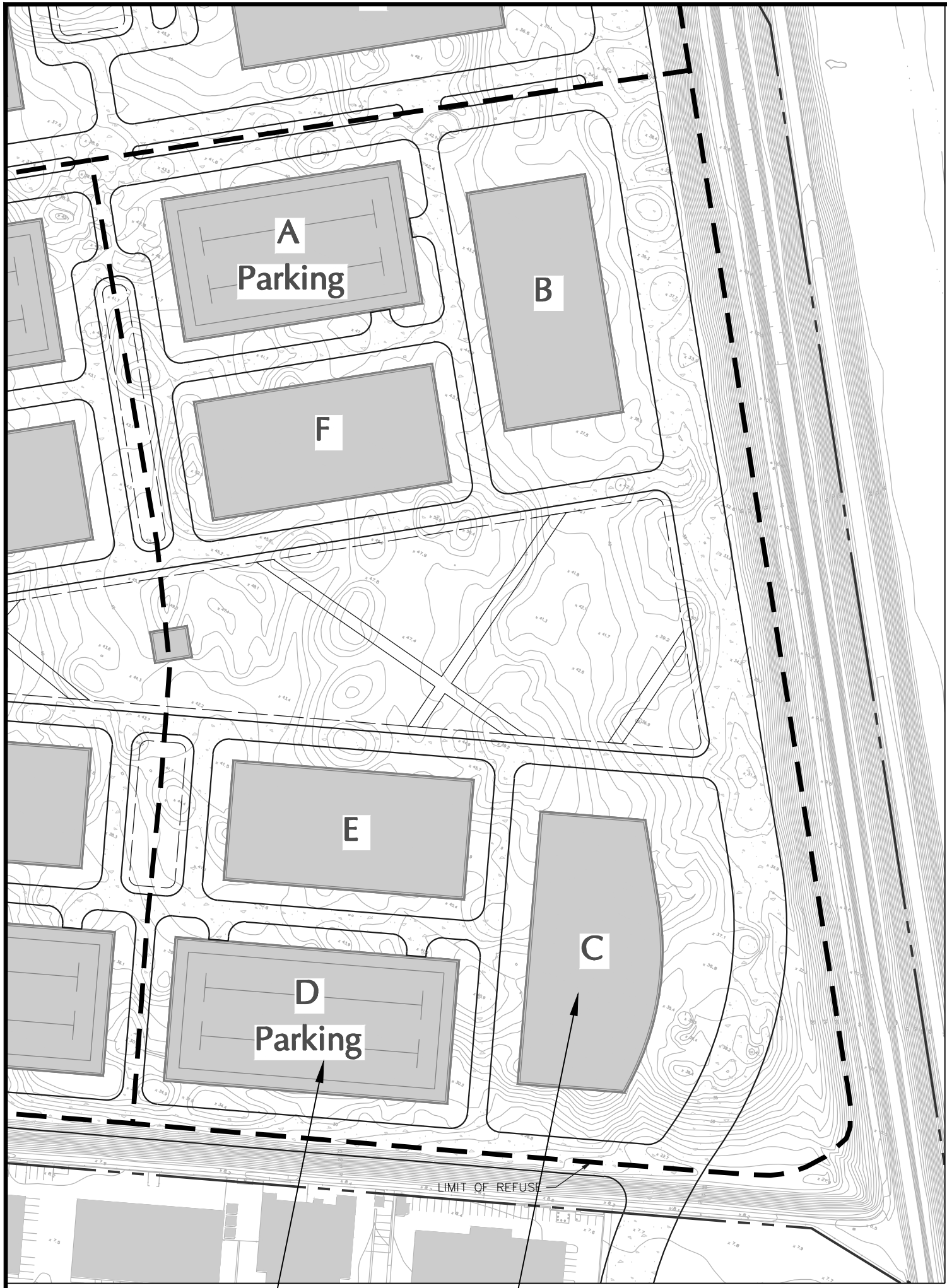
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Sheet 6 of 10



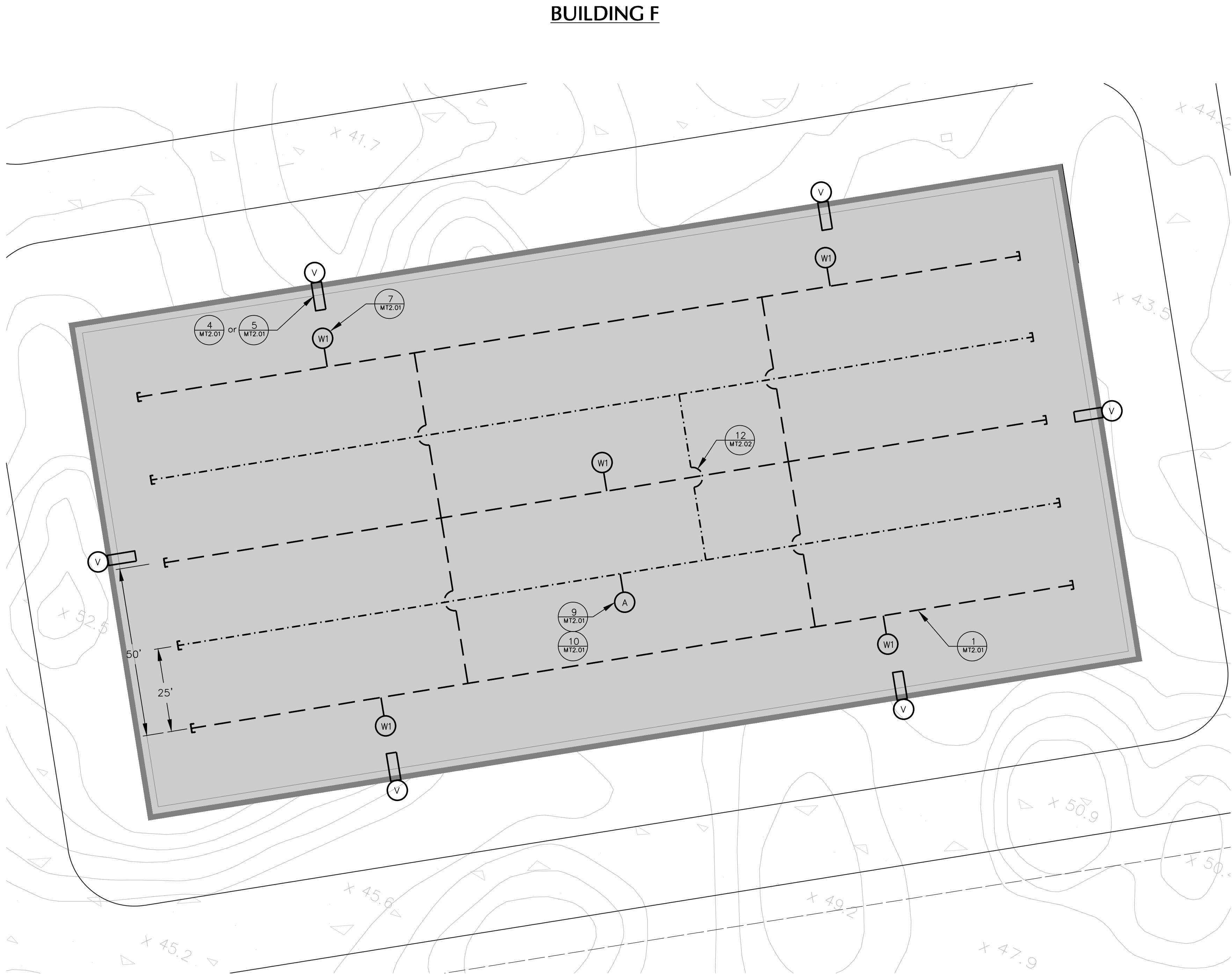




SCALE: 1" = 150'

PLACE VAPOR MEMBRANE AND VENT PIPING WITHIN INTERSTITIAL SPACE ABOVE STRUCTURAL SLAB FOR NON-PARKING STRUCTURES (SEE DETAIL 1, SHEET MT2.01).

FOR PARKING STRUCTURES, PLACE VAPOR MEMBRANE AND VENT PIPING ABOVE STRUCTURAL SLAB (SEE DETAIL 2, SHEET MT2.01).



CONCEPTUAL LANDFILL GAS BUILDING  
MITIGATION PLAN (TYPICAL FOR ALL  
PHASE 7 BUILDINGS)

LEGEND

- PASSIVE 4" DIAMETER PERFORATED PVC PIPE ABOVE STRUCTURAL PLATFORM (SEE NOTE 5 ON SHEET MT2.02 FOR REQUIRED PERFORATION PATTERN)
- CONTINGENCY ACTIVE 4" DIAMETER PERFORATED PVC PIPE ABOVE STRUCTURAL PLATFORM (SEE NOTE 5 ON SHEET MT2.02 FOR REQUIRED PERFORATION PATTERN)
- PVC END CAP
- PASSIVE RISER PIPE TO ROOF (SEE DETAILS ON SHEET MT2.01)
- RISER PIPE TO CONTINGENCY ACTIVE BLOWER ON ROOF (SEE DETAILS ON SHEET MT2.01)
- 4" DIAMETER SCHEDULE 80 PVC VENT PIPE (SEE DETAILS ON SHEET MT2.01)
- SEE DETAIL 1, SHEET MT2.01

NOTES

- VENT PIPES WILL AVOID PILE CAPS AND OTHER FOUNDATION FEATURES, WHERE POSSIBLE, AND ALL AREA OF BUILDING FOOTPRINT WILL BE WITHIN 25 FEET OF VENT PIPE WITH NO OBSTRUCTION TO FLOW (EG, GRADE BEAM IN THE WAY). CONTINGENCY ACTIVE EXTRACTION PIPING PLACED HALFWAY IN BETWEEN RUNS OF VENT PIPING.
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- INLET VENTS WILL BE AS EVENLY SPACED AS POSSIBLE AND GREATER THAN 15 FEET FROM DOOR OR WINDOWS.

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- FOR DETAIL NOTES, SEE SHEET MT2.02.

Phase 7							
Building Letter	Square Footage (ft <sup>2</sup> )	Perimeter (ft)	Number of Inlet Vents	Number of Risers & Wind Turbines	Blower Flow Rating Required (scfm)	Blower Vacuum Requirement (" H <sub>2</sub> O)	Building Type
A	41281	865	6	4	151	14	Parking Garage
B	41250	850	6	4	340	22	Building
C	52722	954	6	5	435	22	Building
D	63622	1066	7	6	233	17	Parking Garage
E	45000	900	6	5	371	22	Building
F	45000	900	6	5	371	22	Building

NOTES

- For blower flow ratings greater than 400 scfm, install multiple blowers such that each blower is less than 400 scfm.
- Frequency of inlet vents, riser and wind turbines, and blower requirements based on conceptual calculations. The design engineer shall determine the actual number and frequency of these components at the time of design.

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CONSTRUCTION

Date	Description	No.
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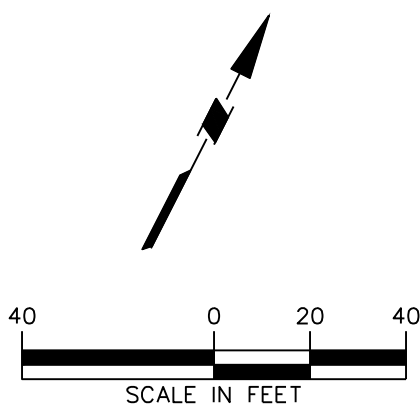
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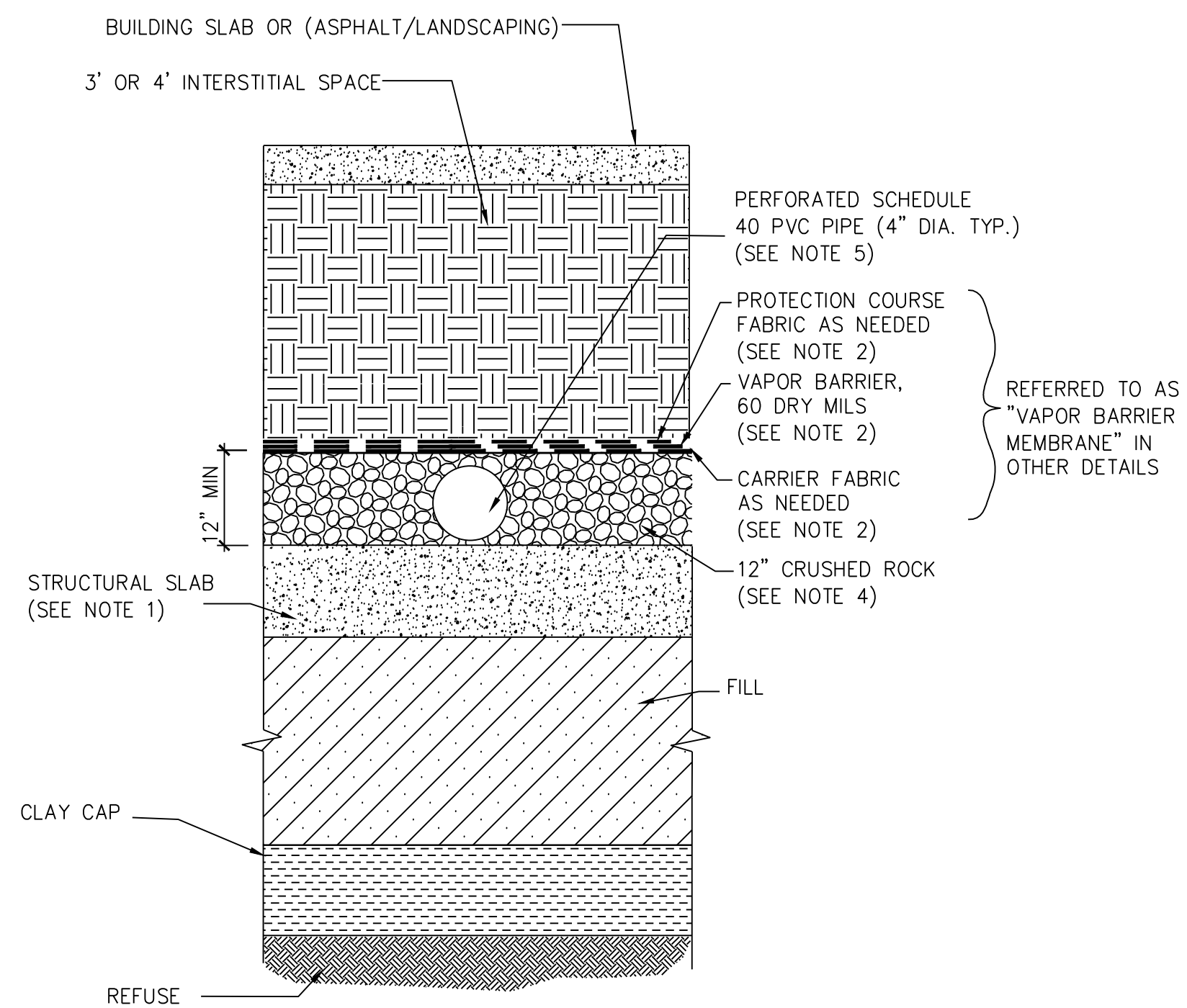
Project  
**CITY PLACE  
SANTA CLARA**

**SANTA CLARA** CALIFORNIA  
Figure Title  
**PHASE 7  
DEVELOPMENT AREA  
CONCEPTUAL LANDFILL  
GAS BUILDING  
MITIGATION PLAN**

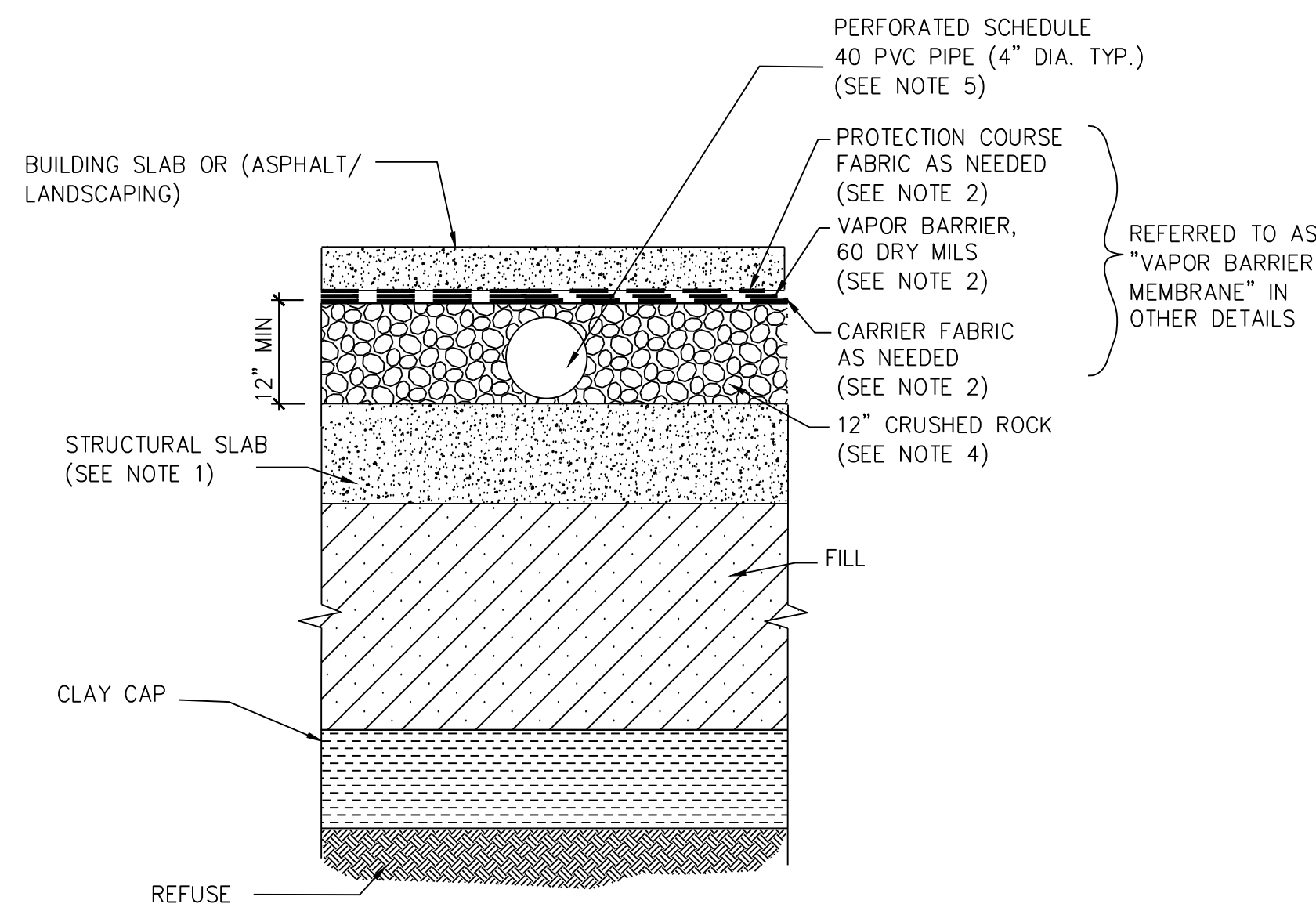
Project No. <b>770611601</b>	Figure
Date <b>12/23/2014</b>	<b>MT1.07</b>
Scale <b>AS SHOWN</b>	
Drawn By <b>CY</b>	
Submission Date <b>X</b>	
Checked By <b>CG</b>	Sheet 7 of 10



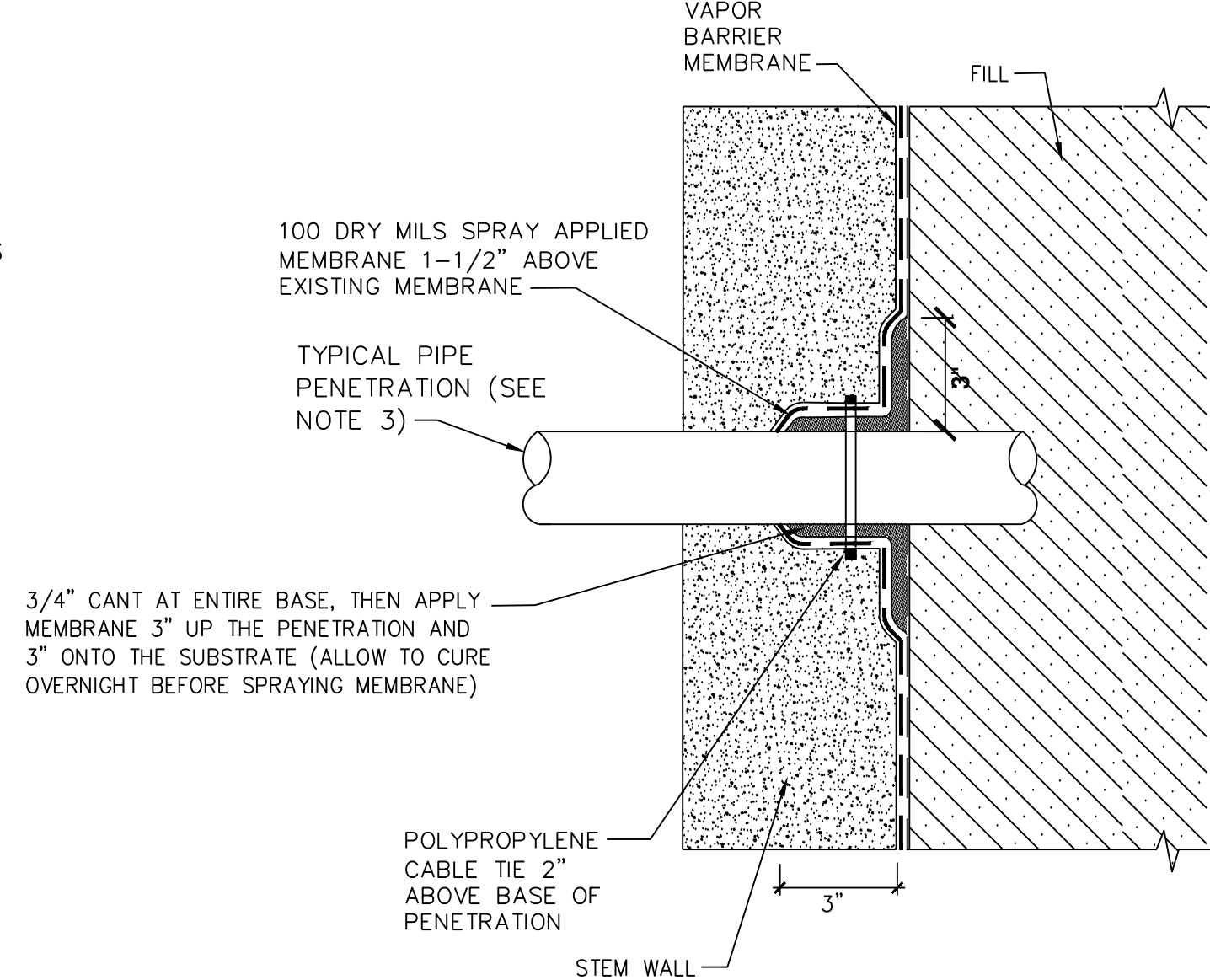




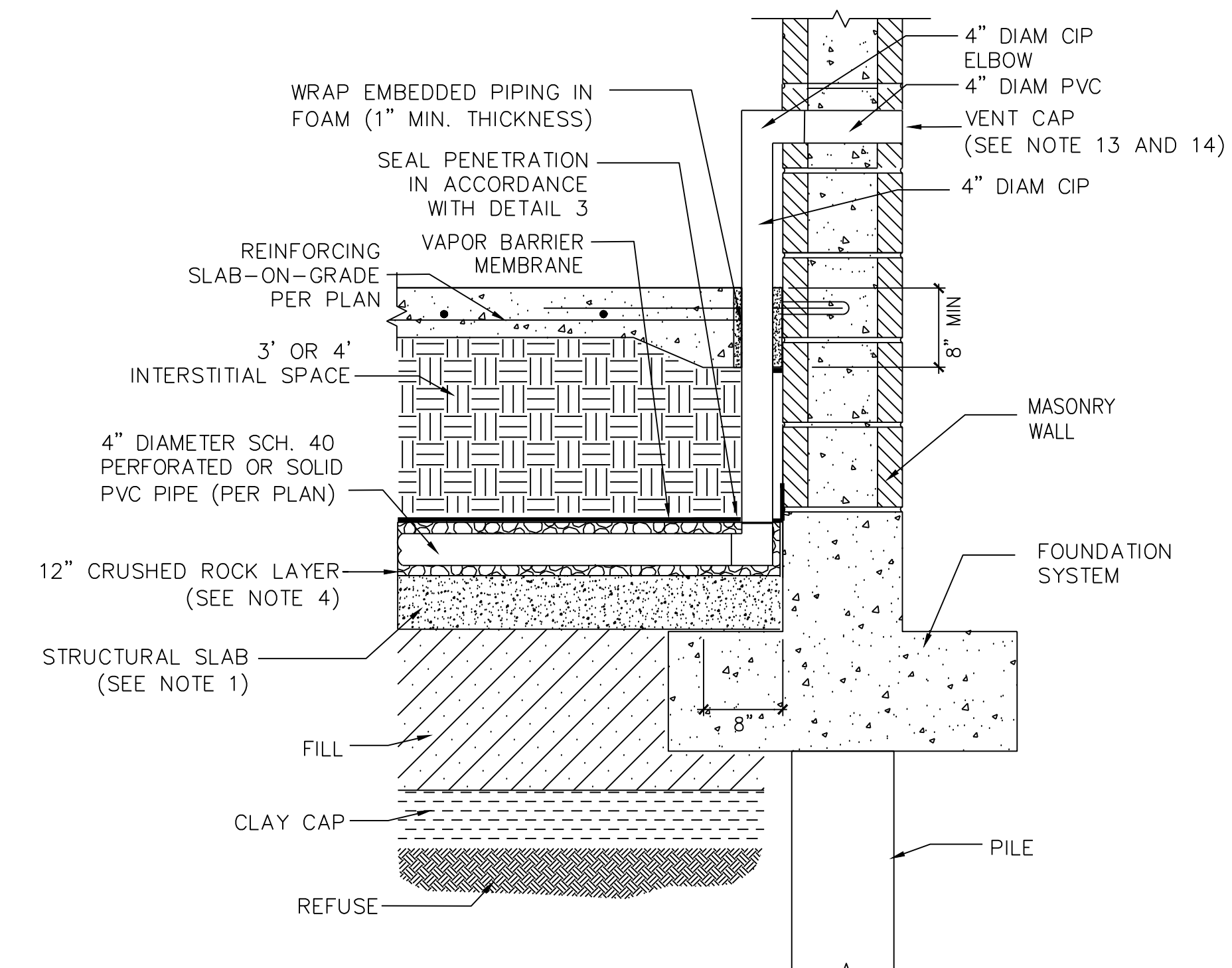
**1 TYPICAL LANDFILL GAS MITIGATION SYSTEM CROSS-SECTION WITHIN PLATFORM STRUCTURE AND NON-PARKING BUILDINGS OUTSIDE PLATFORM STRUCTURE**  
NOT TO SCALE



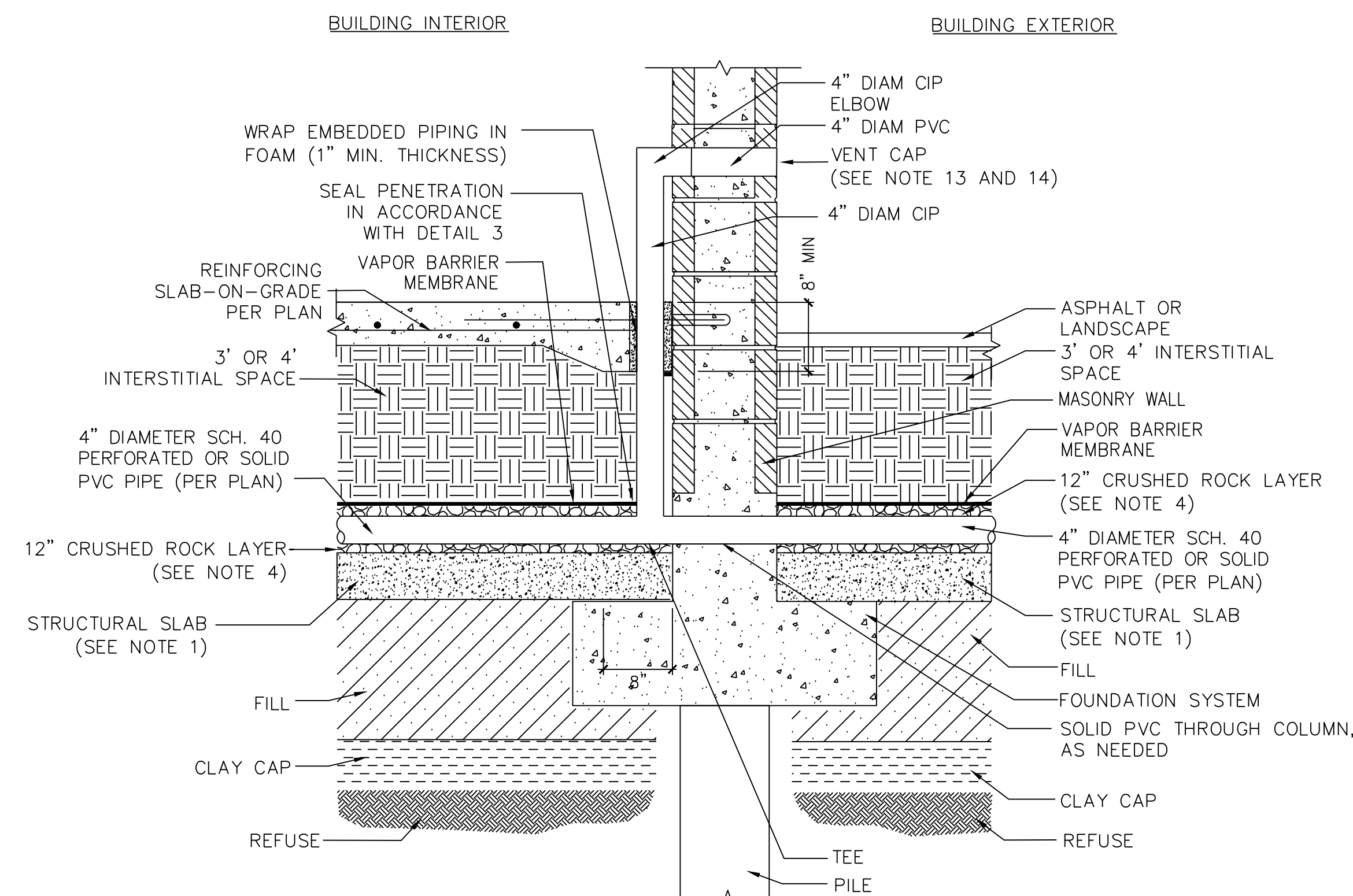
**2 TYPICAL LANDFILL GAS MITIGATION SYSTEM CROSS-SECTION AT PARKING BUILDING OUTSIDE OF PLATFORM STRUCTURE**  
NOT TO SCALE



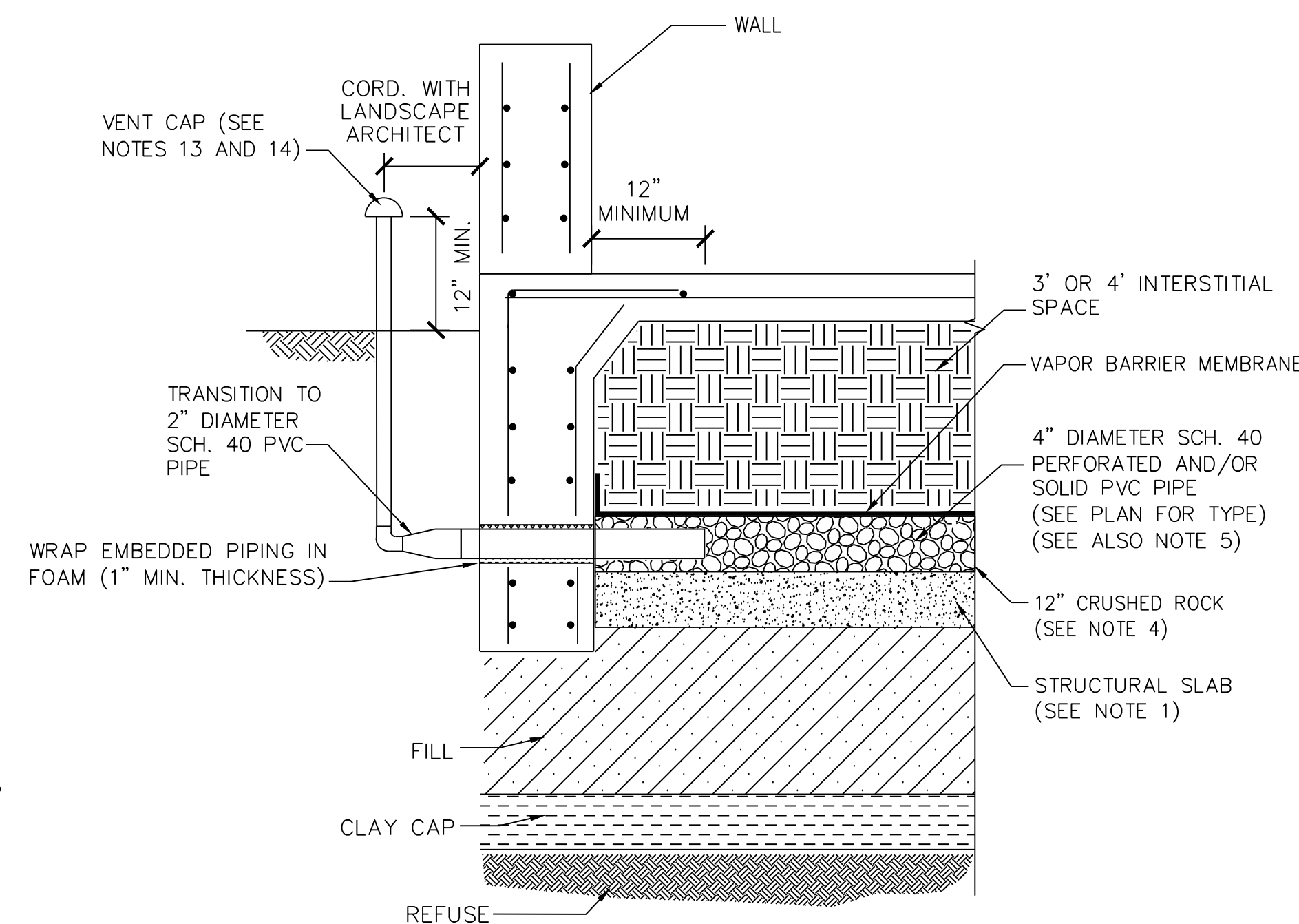
**3 TYPICAL SEALING OF ALL PENETRATIONS THROUGH VAPOR MEMBRANE**  
NOT TO SCALE



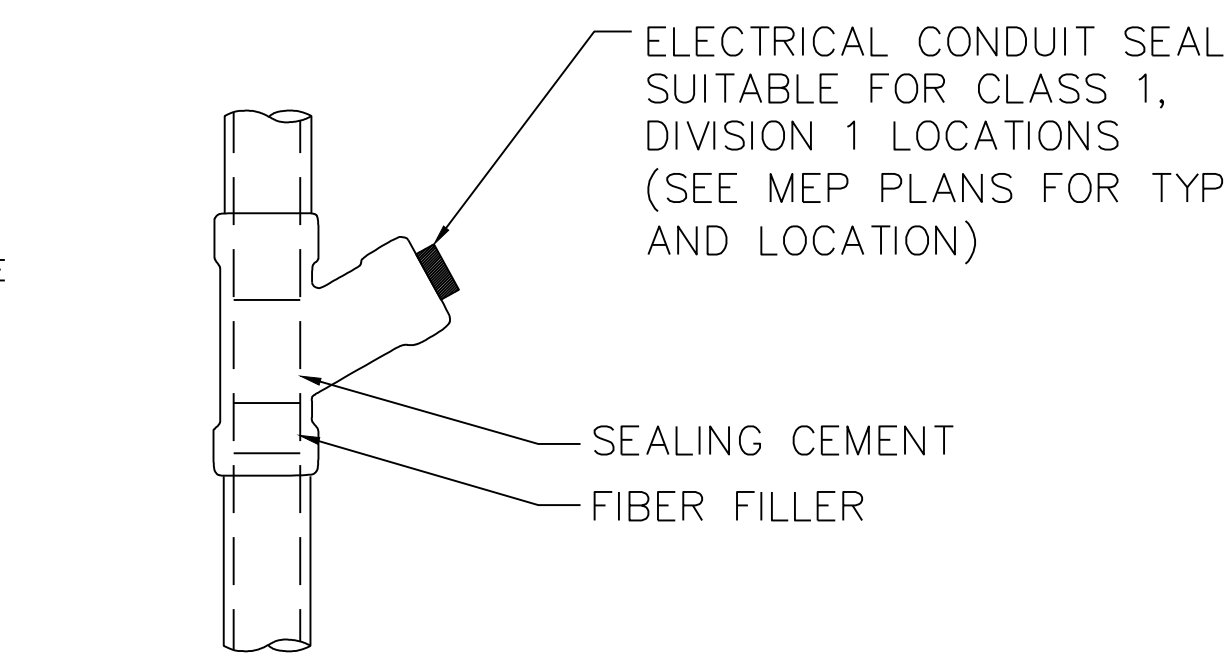
**4 PERIMETER INLET VENT (V)**  
NOT TO SCALE



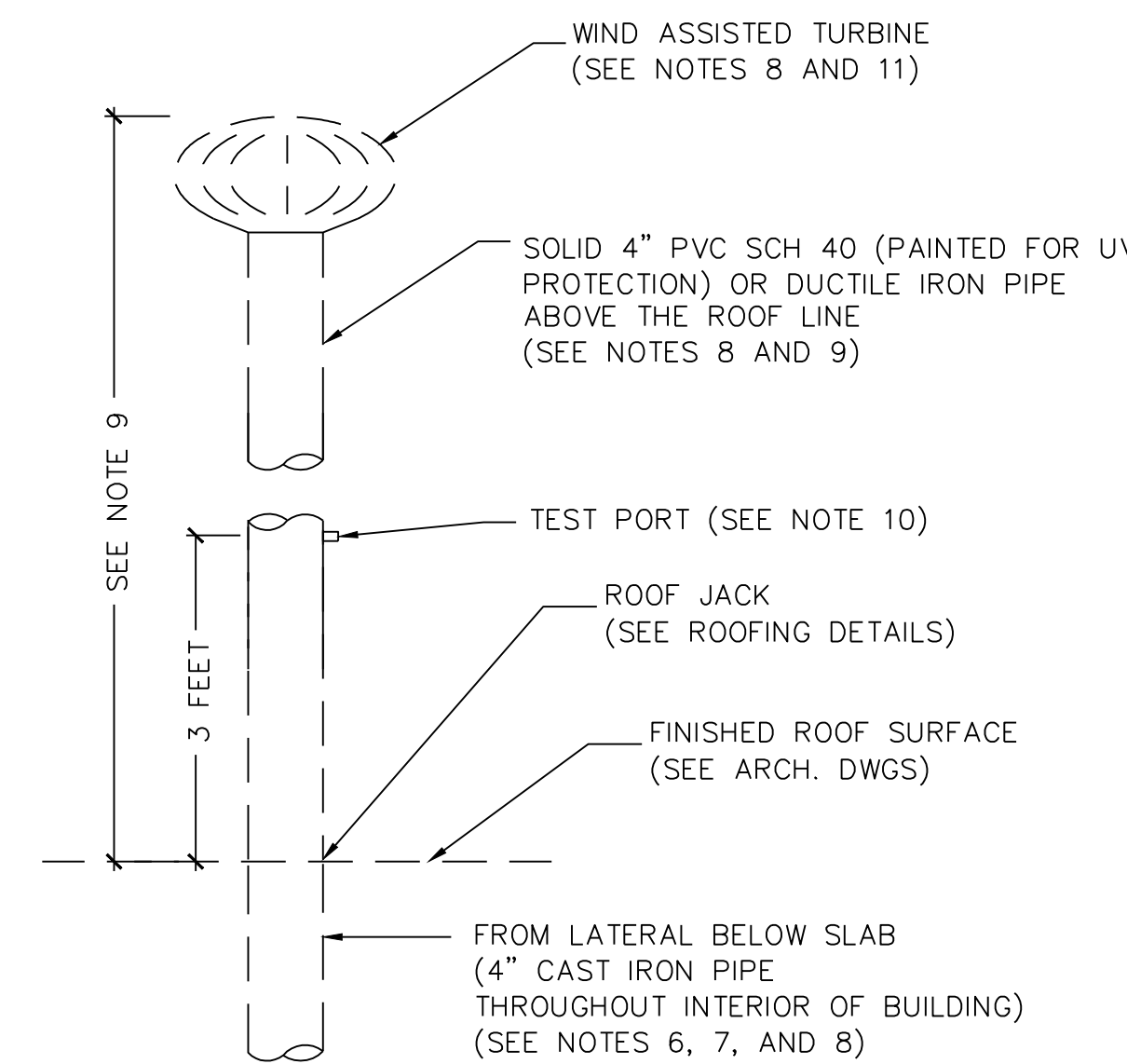
**4A CONCEPTUAL PERIMETER INLET VENT (V) WITHIN PLATFORM STRUCTURE**  
NOT TO SCALE



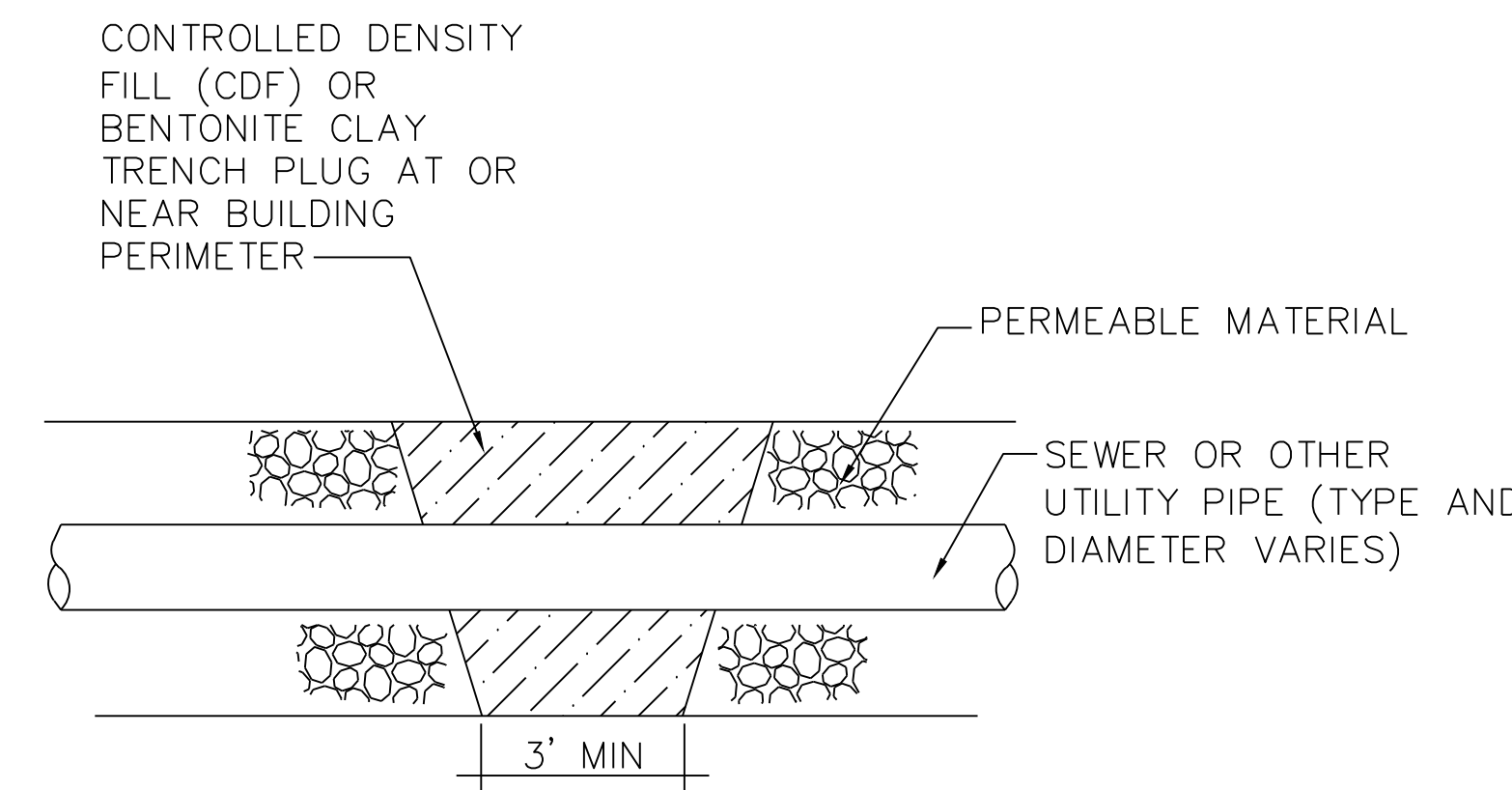
**5 PERIMETER INLET VENT (V1)**  
NOT TO SCALE



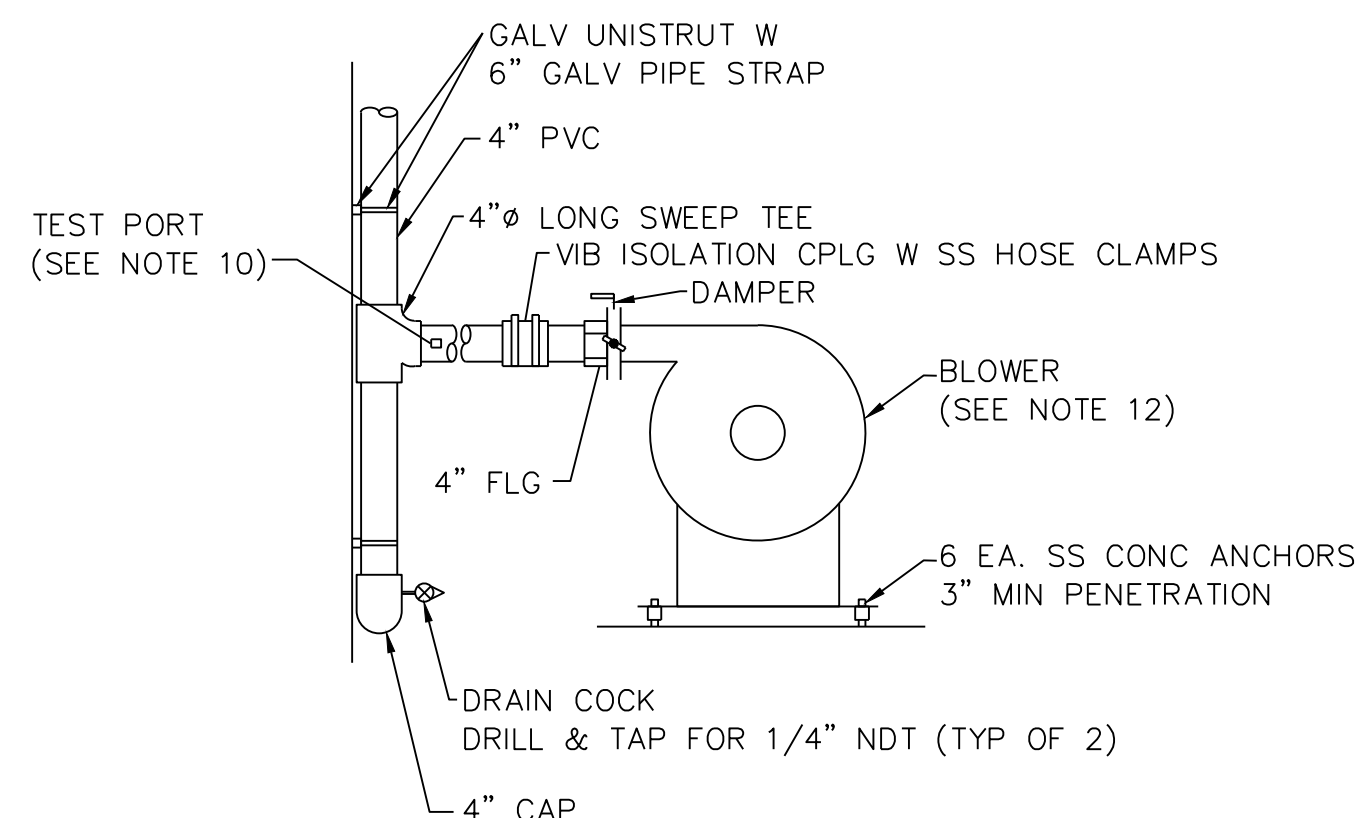
**6 TYPICAL INTERIOR AND EXTERIOR CONDUIT SEAL**  
NOT TO SCALE



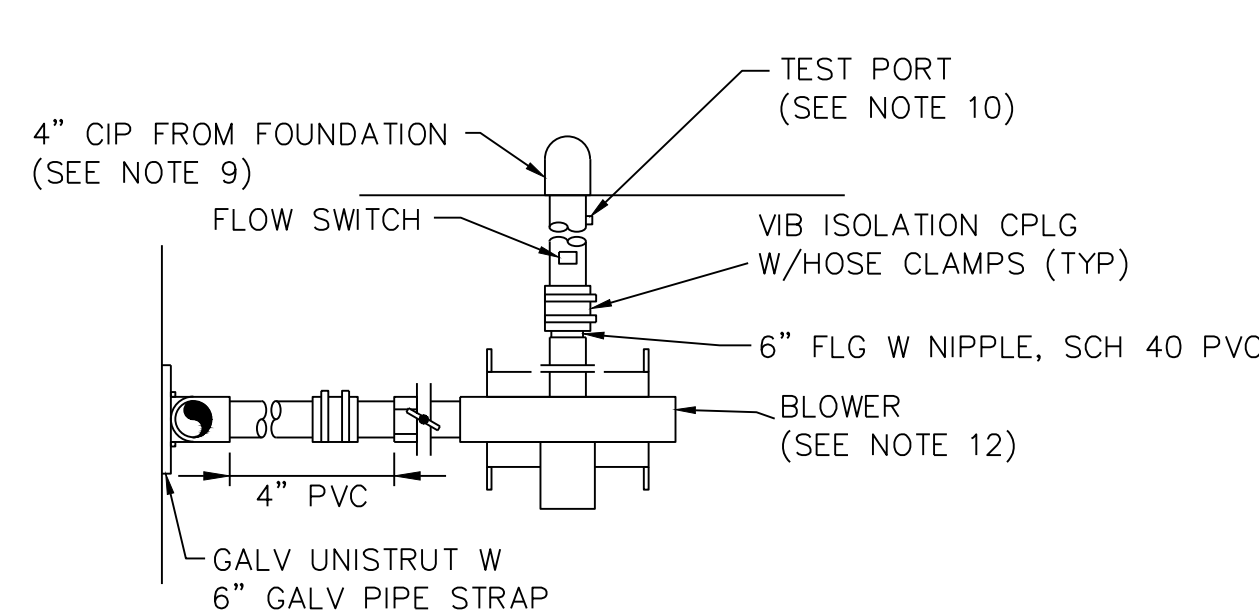
**7 RISER AND TURBINE AT ROOF (W)**  
NOT TO SCALE



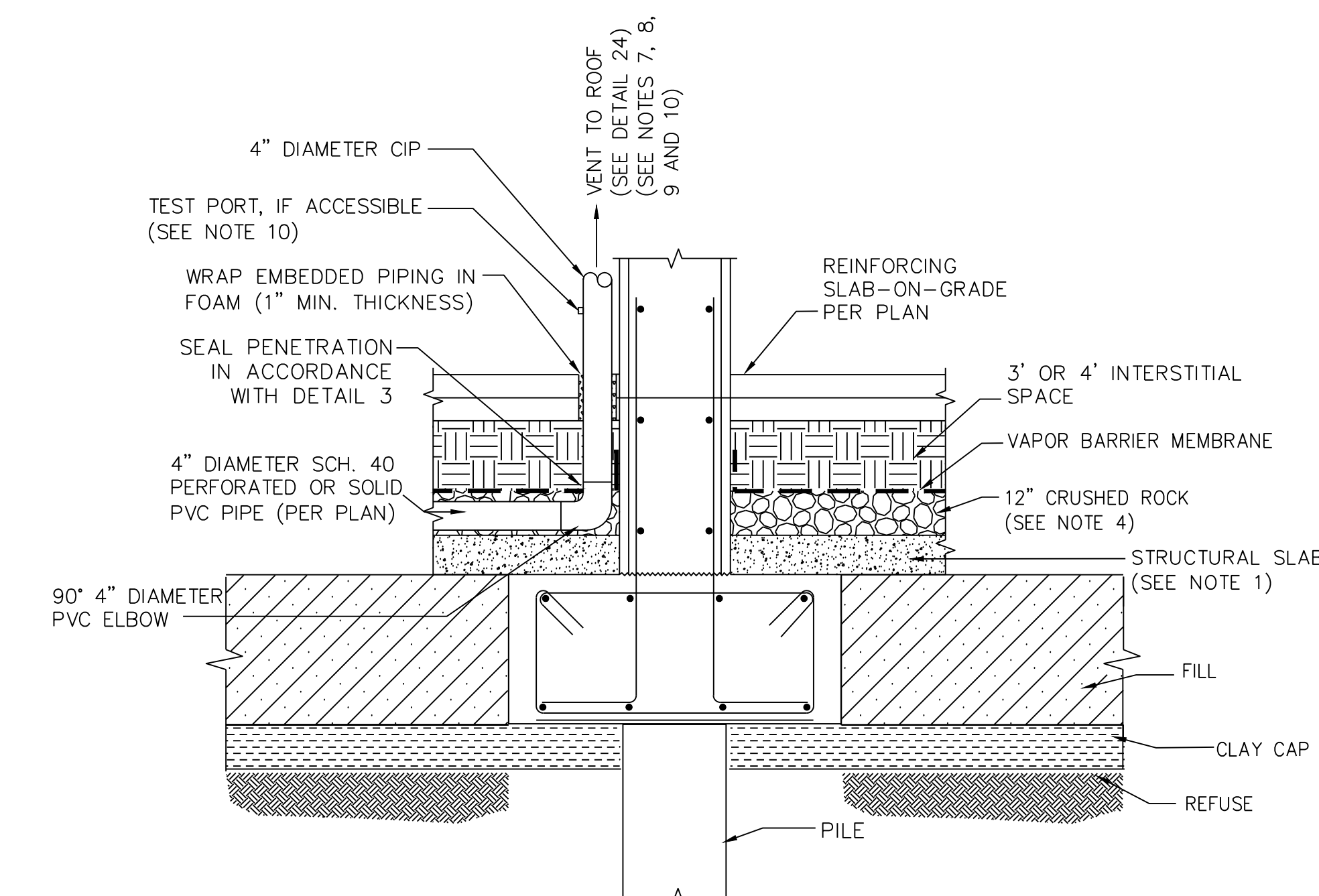
**8 TYPICAL SOIL GAS CUT-OFF BARRIER IN UTILITY TRENCH**  
NOT TO SCALE



**9 TYPICAL CONTINGENCY ACTIVE BLOWER**  
NOT TO SCALE



**10 CONTINGENCY ACTIVE BLOWER INSTALLATION PLAN**  
NOT TO SCALE



**11 HORIZONTAL-TO-VERTICAL RISER TRANSITION AT INTERIOR COLUMN OR WALL**  
NOT TO SCALE

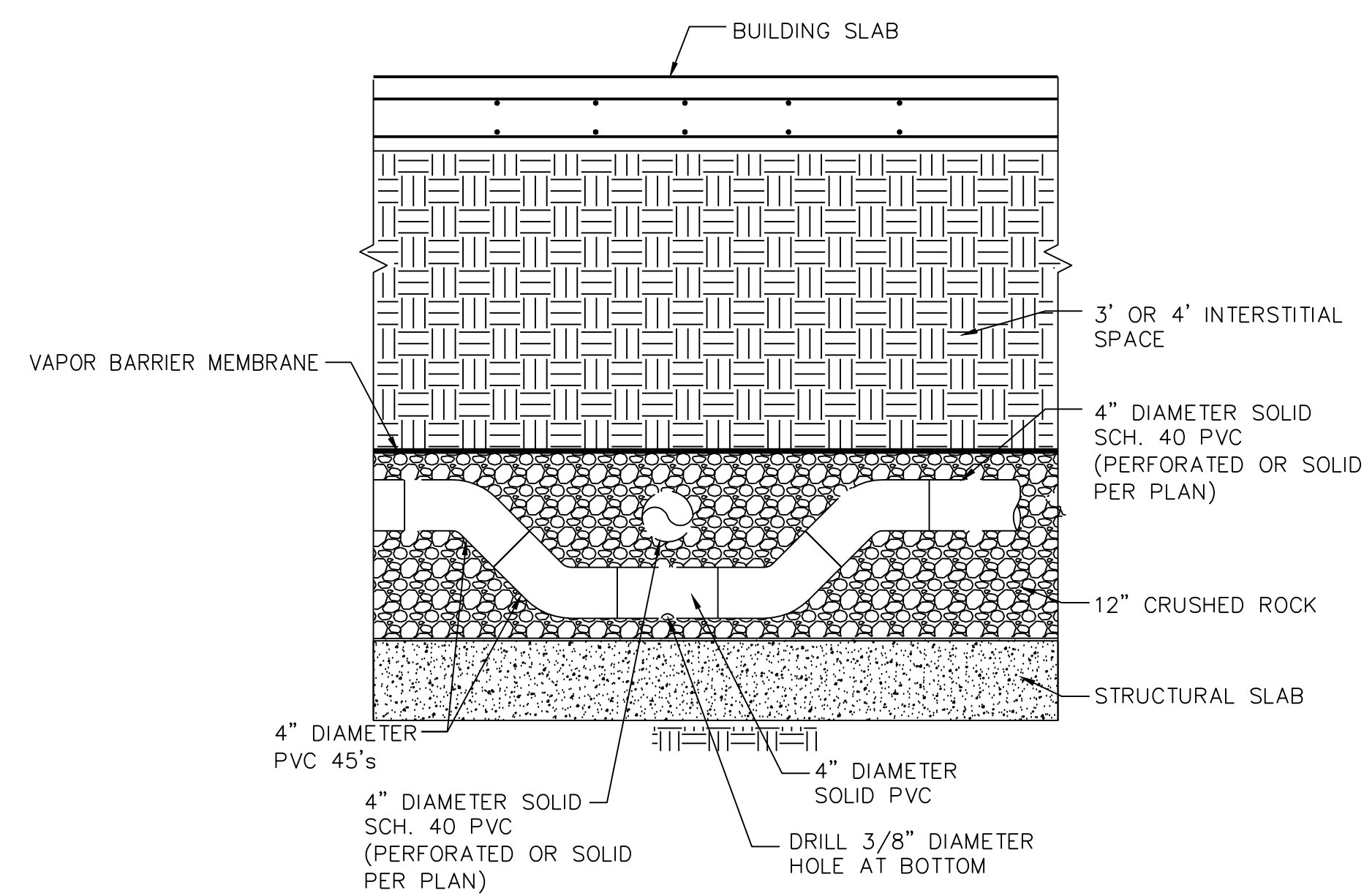
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Project: <b>CITY PLACE SANTA CLARA</b> <b>SANTA CLARA CALIFORNIA</b> Figure Title: <b>CONCEPTUAL LANDFILL GAS BUILDING MITIGATION SYSTEM DETAILS</b>		
Project No.	Figure	
770611601	MT2.01	
Date	12/27/2015	
Scale	AS SHOWN	
Drawn By	AC	Checked By
Submission Date	6/30/2015	Sheet 8 of 10

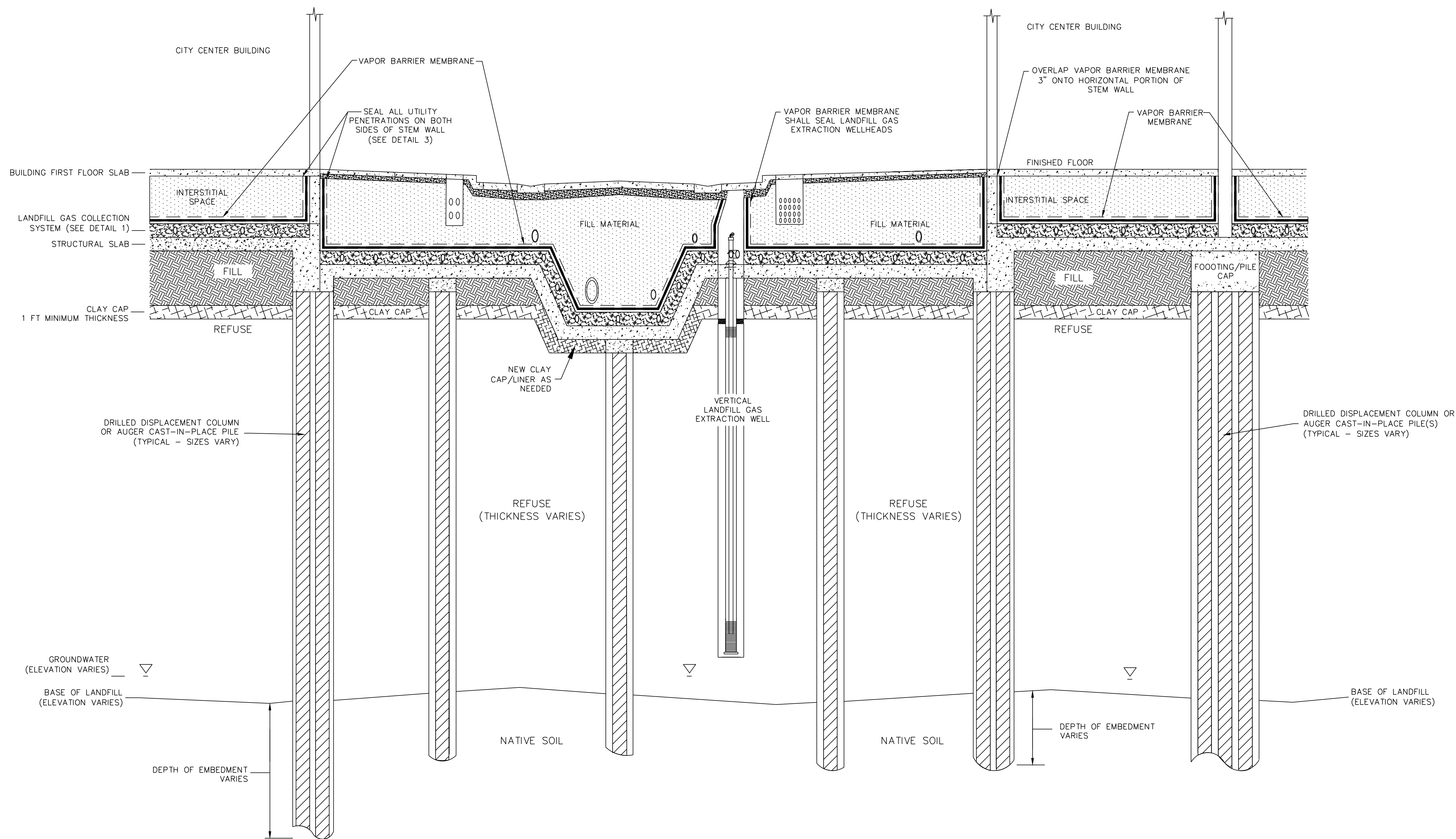


NOTES:

1. ALL LOCATIONS AND DIMENSIONS OF BUILDING SLABS, FOOTINGS, AND GRADE BEAMS TO BE CONFIRMED WITH STRUCTURAL DETAILS.
2. THE VAPOR BARRIER SHALL BE INSTALLED ACCORDING TO MEMBRANE MANUFACTURER'S SPECIFICATIONS AND QA/QC REQUIREMENTS (E.G., COUPON AND SMOKE TESTING) BY A MANUFACTURER APPROVED APPLICATOR. THE NEED FOR A CARRIER FABRIC AND PROTECTION COURSE WILL BE DETERMINED BY THE VMS DESIGN ENGINEER BASED ON THE TYPE OF VAPOR MEMBRANE SELECTED. IF INSTALLED, CARRIER FABRIC AND PROTECTION COURSE FABRIC SHALL BE PER MEMBRANE MANUFACTURER'S SPECIFICATIONS.
3. SLAB PENETRATIONS SHALL NOT BE IN CONTACT WITH AN ADJACENT PENETRATION THAT WOULD PREVENT PROPER SEALING OF THE PENETRATION CIRCUMFERENCE. SLAB PENETRATIONS SHALL BE PREPARED AND STUBBED PRIOR TO MEMBRANE INSTALLATION.
4. CRUSHED ROCK SHALL BE 1/4" 3/4" (100% PASSING 1-INCH; 90% PASSING 3/4-INCH; 10% MAXIMUM PASSING #4). SURFACE OF ROCK LAYER SHALL BE SMOOTH ROLLED PRIOR TO APPLICATION OF THE CARRIER FABRIC. ROCK LAYER SHALL BE 12" MINIMUM.
5. HORIZONTAL COLLECTION PIPE SHALL BE SCH. 40 PVC OR SIMILAR QUALITY PLASTIC PIPE. INDICATED SECTIONS OF HORIZONTAL COLLECTION PIPE SHALL BE PERFORATED WITH 5/8 INCH DIAMETER HOLES, THREE HOLES ACROSS THE UPPER ONE-THIRD OF THE PIPE, EVERY THREE INCHES ALONG THE PERFORATED SECTION. AN ADDITIONAL 5/8 INCH DIAMETER HOLE SHALL BE DRILLED ON THE UNDERSIDE OF THE PIPE AT LEAST EVERY TWO LINEAR FEET ALONG THE PERFORATED SECTION TO ALLOW WATER, IF ANY, TO DRAIN FROM THE PIPE. PERFORATED PIPE SHALL BE SLEEVED WITH A GEOTEXTILE FABRIC TO PREVENT ACCUMULATION OF FINES WITHIN THE SYSTEM. HORIZONTAL COLLECTION PIPE SHALL BE PLACED IN THE UPPER HALF OF THE CRUSHED ROCK LAYER.
6. VERTICAL RISER PIPES SHALL BE SUPPORTED AT THE PIPE CHASE WALLS AND HUNG FROM CEILINGS, AS NEEDED. ALL PIPE MATERIALS USED INSIDE THE BUILDING MUST BE CAST IRON PIPE. MINOR (< 5 FEET) JOGS IN THE VERTICAL RISER TO AVOID UTILITIES BENEATH ROOF LEVEL ARE ACCEPTABLE.
7. VERTICAL RISER PIPES SHALL BE LABELED AS "CONTAINS METHANE GAS AND VAPORS; DO NOT BREAK OR CUT."
8. THE VERTICAL RISER PIPE TO THE WIND-ASSISTED OR BLOWER-ASSISTED VENTS SHALL BE 4 INCH DIAMETER CAST IRON PIPE (MAY TRANSITION AT ROOF LEVEL TO PAINTED SCHEDULE 80 PVC). VERTICAL RISER PIPE SHALL EXTEND TO AN ELEVATION ABOVE ROOF LEVEL SUCH THAT IT EXTENDS A MINIMUM OF 12 INCHES ABOVE SURROUNDING PARAPET OR WINDSCREEN AND IS OUTSIDE OF ANY WIND SHADOW. THE RISER PIPE SHALL BE LOCATED A MINIMUM OF 15 FEET FROM ANY FRESH AIR INTAKES.
9. THE VERTICAL RISER PIPE TO THE WIND-ASSISTED OR BLOWER-ASSISTED VENTS SHALL BE SECURED WITH FOUR 1/8 INCH AIRCRAFT CABLES TO PREVENT EXCESSIVE MOVEMENT. OTHER APPROPRIATE FASTENING MEASURES MAY BE USED WITH APPROVAL FROM A/E TEAM.
10. TEST PORTS SHALL BE INSTALLED ON VERTICAL RISER PIPES, 36 INCHES ABOVE ROOF LEVEL, FOR AIR SAMPLING. THE TEST PORT FOR THE BLOWER ASSISTED RISER SHALL BE INSTALLED AS SHOWN IN DETAIL 10. TEST PORT SHALL ALSO BE INSTALLED AT GROUND FLOOR LEVEL, IF THE RISER CAN BE PRACTICALLY ACCESSED AT THIS LOCATION.
11. THE WIND-ASSISTED TURBINE ON TOP OF THE 4 INCH PVC RISER SHALL BE 12 INCH DIAMETER STAINLESS STEEL (MCMASTER-CARR CAT#1992K48, OR EQUIVALENT) AND SHALL BE SECURED TO THE TOP OF THE RISER.
12. BLOWER SHALL MEET FLOW RATE AND PRESSURE REQUIREMENTS AS SHOWN ON SHEETS MT1.02 TO MT1.07, WITH HAZARDOUS LOCATION ENCLOSURE. BLOWER MUST BE UL LISTED, CLASS I, GROUP D TYPE. THE BLOWER WILL BE SCHEDULED FOR ROUTINE (MONTHLY) OPERATION TO PREVENT UNWANTED MOISTURE AND PRECIPITATION BUILDUP.
13. PERIMETER INLET VENTS SHALL BE LOCATED A MINIMUM 15 FEET FROM DOORS OR WINDOWS. IF THE 15-FOOT MINIMUM DISTANCE IS NOT POSSIBLE, THE NEED FOR CHECK-VALVES TO PREVENT RELEASE OF SUBSLAB VAPOR TO THE EXTERIOR SHALL BE CONSIDERED.
14. SUBSLAB INLET VENTS SHALL BE FITTED WITH A VENT CAP TO KEEP OUT DEBRIS BUT ALLOW AIR TO ENTER THE PIPE. INLET VENT SHALL TERMINATE 2 FEET MIN ABOVE EXTERIOR GRADE.
15. DURING SUBGRADE PREPARATION, PROTRUDING OBJECTS WILL BE CRUSHED AND/OR REMOVED AND ANY RESULTING VOIDS WILL BE FILLED WITH ADDITIONAL GRAVEL OR ACCEPTABLE FILL. SUBGRADE SHALL BE PREPARED WITH A GRADING TOLERANCE OF +/- 0.1 FOOT.



**12 TYPICAL VENT PIPE CROSSING**  
**NOT TO SCALE**



13 LANDFILL MITIGATION SYSTEM CONCEPT AT PLATFORM STRUCTURE  
NOT TO SCALE

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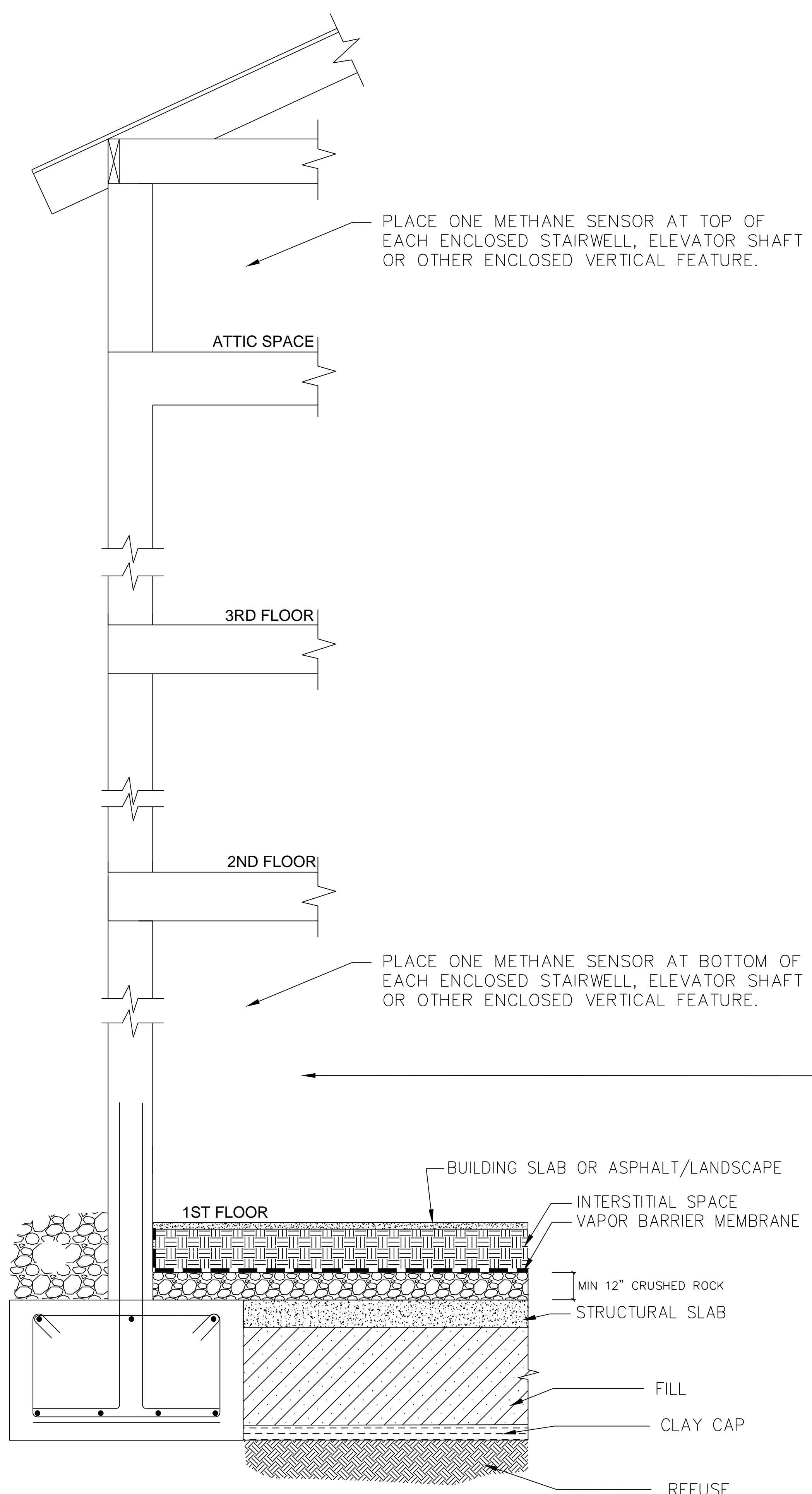
**SANTA CLARA**

Figure Title

## CONCEPTUAL LANDFILL GAS BUILDING MITIGATION SYSTEM DETAILS

Project No. <b>770611601</b>		Figure  <b>MT2.02</b>
Date <b>12/30/2015</b>		
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Drawn By <b>AC</b>	Checked By <b>DE</b>	
Submission Date <b>6/30/2015</b>		
		Sheet 9 of 10





CONCEPTUAL BUILDING ELEVATION

TABLE 1 - DETECTOR SPACING FOR 1ST FLOOR OF RESIDENTIAL/COMMERCIAL BUILDING

ROOM FLOOR AREA OR CONCEALED SPACE AREA (square feet)	NUMBER OF DETECTORS	
	WITH HEATING, VENTILATION OR AIR CONDITIONING	WITHOUT HEATING, VENTILATION OR AIR CONDITIONING
10,000 and More	Minimum of 3 Detectors plus one for every 20,000 and fraction thereof in excess of 10,000	Minimum of 6 Detectors plus one for every 2,500 and fraction thereof
More Than 5,000 and Less Than 10,000	3 Detectors	Minimum of 2 Detectors plus one for every 2,500 and fraction thereof
More Than 1,000 and Up to 5,000	2 Detectors	Minimum of 1 Detector plus one for every 2,500 and fraction thereof
0 and Up to 1,000	1 Detector	1 Detector

NOTE:  
Rooms connected by a shared HVAC system are considered a single "room floor area" for the purpose of determining detector frequency.

TABLE 2 - DETECTOR SPACING IN INTERSTITIAL SPACE

INTERSTITIAL SPACE AREA (square feet)	NUMBER OF DETECTORS
10,000 and More	Minimum of 3 Detectors plus one for every 20,000 and fraction thereof in excess of 10,000
More Than 5,000 and Less Than 10,000	3 Detectors
More Than 1,000 and Up to 5,000	2 Detectors
0 and Up to 1,000	1 Detector

NOTES:

1. THE METHANE SENSOR NETWORK SHALL INCLUDE LOW LEVEL, HIGH LEVEL AND FAULT ALARMS. AN AUDIBLE HORN ALARM SHALL SOUND DURING HIGH ALARM ACTIVATION.
2. LOW ALARM ACTIVATION SHALL OCCUR AT 10% OF THE LOWER EXPLOSION LIMIT (LEL) OF METHANE GAS AND SIGNALS SHALL BE SENT TO THE ROOFTOP CONTROLLER TO ACTIVATE START OF CONTINGENCY BLOWER.
3. FAULT ALARM ACTIVATION SHALL OCCUR AT LOSS OF SENSOR SIGNAL, LOSS OF CONTROLLER POWER, AND/OR LOSS OF SAMPLE DRAW ON SENSORS USING REMOTE SAMPLE TECHNOLOGY. USING FAULT ALARM, A SIGNAL SHALL BE SENT TO THE BUILDING ENGINEER TO INSPECT/REPAIR SYSTEM.
4. HORN ALARM ACTIVATION SHALL OCCUR AT 25% OF THE LEL OF METHANE GAS AND SIGNALS SHALL BE SENT TO THE FIRE ALARM CONTROL PANEL (FACP). THE FACP WILL ACTIVATE BUILDING HORN/STROBES AT THE FACILITY ENGINEERING OFFICE, AND SEND AN ALARM TO A 24-HOUR MONITORING COMPANY INDICATING A "25% LEL METHANE GAS ALARM".
5. ALARM RELAYS CONTACTS SHALL BE WIRED OPEN UNDER NORMAL CONDITIONS AND SHALL CLOSE ON ALARM OR LOSS OF POWER.
6. ALL SENSOR AND CONTROL WIRE PENETRATIONS SHALL MEET CURRENT WALL, FLOOR, AND CEILING PENETRATION REQUIREMENTS AND SHALL BE SEALED WITH "APPROVED FREE RATED CAULKING".
7. DESIGN ENGINEER SHALL REVIEW ALARM THRESHOLDS AND ADJUST AT THE TIME OF DESIGN. SENSORS WITHIN INTERSTITIAL SPACE MAY ALARM AT HIGHER METHAN LEVELS, AT THE DISCRETION OF THE DESIGN ENGINEER.

TABLE 3 - DETECTOR SPACING FOR 1ST FLOOR OF PARKING STRUCTURES

CONCEALED SPACE AREA (square feet)	NUMBER OF DETECTORS
10,000 and More	Minimum of 3 Detectors plus one for every 20,000 and fraction thereof in excess of 10,000
More Than 5,000 and Less Than 10,000	3 Detectors
More Than 1,000 and Up to 5,000	2 Detectors
0 and Up to 1,000	1 Detector

NOTE:  
\* Table applies to enclosed areas of parking garages. For open air portion of the garage, install methane detectors of frequency of 1 per 50,000 sf.

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Project		
CITY PLACE SANTA CLARA		
SANTA CLARA CALIFORNIA		
Figure Title		
CONCEPTUAL METHANE GAS BUILDING MONITORING SYSTEM		
Project No. 770611601		Figure MT3.01
Date 12/27/2015		
Scale AS SHOWN		
Drawn By AC	Checked By JTB	
Submission Date 6/30/2015		
Sheet 10 of 10		